ANNUAL REPORT
OF
PROGRAM ACTIVITIES

NATIONAL INSTITUTES OF HEALTH

1959

DIVISION OF RESEARCH SERVICES
DIVISION OF GENERAL MEDICAL SCIENCES
DIVISION OF RESEARCH GRANTS

NATIONAL INSTITUTES OF HEALTH
PUBLIC HEALTH SERVICE
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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REPORT OF PROGRAM ACTIVITIES

US NATIONAL INSTITUTES OF HEALTH, DIVISION OF RESEARCH SERVICES

Summary of Program Activities
Calendar Year 1959

The Division of Research Services, which employs more than 800 persons with approximately 200 individual occupational skills, provides the scientific, technical, and engineering services required to support and further the complex research programs of the National Institutes of Health. The Division is composed of six branches: Plant Engineering, Sanitary Engineering, Scientific Reports, Laboratory Aids, Biometrics, and Research Facilities Planning.

DRS Programs--1959

Operated and maintained all buildings, utilities, and grounds within the NIH plant and installed and helped maintain various types of equipment.

Provided design, engineering, and construction services for the comprehensive NIH building and remodeling program.

Coordinated the planning of all construction and remodeling work, and conducted engineering and architectural studies to assure the orderly development and growth of NIH facilities.

Conducted independent Division studies--over and above those specifically requested--for the purpose of anticipating NIH research needs and improving the quality of the services provided by the Division.

Provided photographic, art, library, translating, writing, and editorial services to all of NIH.

Produced and supplied laboratory animals and media for use in research.

Provided comparative pathology services for the control or eradication of disease among laboratory animals.

Provided veterinary services, including diagnostic, surgical, X-ray, and animal quarantine, to NIH research projects.

Designed, developed, and fabricated scientific apparatus and glassware, electronic equipment, and medical and surgical instruments that were not obtainable from commercial sources.

Designed, maintained, and tested mechanical apparatus for research, clinical, and office needs.

Designed, installed, maintained, and tested electrical, water, waste disposal, and other utility systems throughout NIH.

Washed, sterilized, and repaired NIH laboratory glassware.

Studied and improved all aspects of environmental health and sanitation at NIH, including food service facilities, air pollution, and insect and rodent control.

Provided various engineering and specialized services for germ-free investigations at NIH and continued studies in sterilizing techniques for germ-free animal diets and equipment.

Provided biometric consultative services on the design, execution, and analysis of experiments and studies conducted by the Institutes and DBS, and conducted independent research investigations within the Biometrics Branch.

Operated an expanded central statistical data processing unit and conducted research in the field of data processing with view to increasing the potential of electronic computer and automatic processing techniques for application to medical science specialties represented at NIH.

Sponsored, conducted, and participated in review, refresher, and job-related courses designed for senior technologists, administrative personnel, laboratory technicians, and animal caretakers.

Accomplishments

Construction The Mental Health Research Greenhouse was completed in January 1959. Construction began in 1959 on four major buildings: Dental Research Building, Surgical Wing to the Clinical Center, General Office Building, and National Library of Medicine. The Biologics Standards Building, begun in 1958, was nearing completion, and occupancy was planned for mid-1960. The first of two extensions to the Heating and Refrigeration Building, to provide air-conditioning services to the new structures, is also under construction, and planning is under way for additional air-conditioning facilities and several other major construction projects. DRS, through its Research Facilities Planning Branch, maintains close liaison with construction activities at the National Library of Medicine because of future responsibility at NIH to provide operation and maintenance services.

New Animal Farm An option to purchase a 500-acre farm in western Montgomery County was obtained by a Site Selection Committee in November 1959. NIH will assume ownership of the property early in 1960. The farm will be used primarily for conducting research projects using laboratory animals and as a holding and conditioning area for large research animals, such as horses and cows. Care of the animals will be the responsibility of the Laboratory Aids Branch, while service and maintenance will be provided by other DRS branches. At year end, a survey of Institute research needs had been instituted preparatory to initial studies leading to the formulation of a master site plan, which will diagram location of roadways, waste disposal, water, and sewer systems, and other utilities.

Master Plans for NIH Reservation A contract was awarded for the evaluation of central utilities serving existing and future NIH buildings, for recommendations leading to the correction of known and suspected deficiencies in specific distribution systems, and for the preparation of a master utilities plan to accommodate all buildings projected in the master site plan prepared in 1957 and revised in 1959. A master landscaping plan is in the early stages of development; it will include shrubbery and planting plans for

all new buildings as well as for the remainder of the reservation. A buildings and grounds manual containing historical, cost, and factual information about construction was completed for each of the existing buildings.

Sterilization Techniques

Two new developments in sterilization techniques explored by the Sanitary Engineering Branch are of particular significance to medical research: (1) Uniform sterilization of germ-free animal diets by electron beam irradiation has led to the confident use of the technique in NIH laboratories engaged in germ-free animal research and to the projecting of further diet and sterilization studies preparatory to the establishment of centralized germ-free animal breeding services; and (2) careful evaluation of gas sterilization equipment, methods, and safety has led to the routine use of gas sterilization at NIH for plastic components of the heart-lung machine, heart catheters, oxygen tents and books, and other heat-sensitive materials.

Organizational Changes

There were a number of organizational changes in the Division during 1959. These were dictated by the need to strengthen service areas within the Division and to increase their general usefulness to NIH research programs.

The Media Preparation and Glassware Sections were combined in the Laboratory Aids Branch.

Establishment of a project control office in the Plant Engineering Branch and consolidation and physical relocation of the carpentry, electric, plumbing, paint, and machine shops that make up the complex of central maintenance and repair shops serving NIH were effected late in the year. Gains in space, reduction of operating costs, and improved management effectiveness have already been achieved.

Steps were taken leading to the transfer, on January 1, 1960, of the Russian Scientific Translation Program to the Division of Research Grants following an interim period of dual responsibility shared by DRG (grants and contracts) and the Scientific Reports Branch (fiscal administration and public relations). The program originated in 1957 and developed under the aegis of the NIH Library. A consultant has been selected to study the research mission of the library and prepare recommendations concerning its organization, staffing, services, and inter-library relationships. Other proposed changes affecting the Scientific Reports Branch and a redirection of its services were also discussed.

Two other organizational changes were also under consideration at the end of the year: (1) a proposal to elevate the Instrument Section to Branch status in recognition of the need to strengthen medical instrumentation at NIH and to enable the Laboratory Aids Branch to devote increasing attention to veterinary and animal production responsibilities, and (2) a proposal to create a new Computation and Data Processing Branch, which would provide NIH research programs with consultation on new developments in the application and use of electronic computer, accounting, and data-processing equipment and techniques. Under the latter proposal the biometrics function of the present Biometrics Branch would be discontinued, and the professional staff would be transferred to the National Heart Institute.

Division Staffing

In keeping with the Division's long-range plans to strengthen central and supervisory personnel levels, a number of new appointments were made during the year.

A budget analyst and an administrative assistant were added to the Office of the Chief.

A supervisory statistician with a doctorate in mathematics was engaged to organize the nucleus of a new computation and data processing branch.

A new NIH Librarian, and the first Assistant Librarian were appointed in the Scientific Reports Branch; both have extensive library administration experience in DHEW.

The Assistant Chief of the Laboratory Aids Branch, the first veterinarian to earn a D.P.H. degree, was promoted to Chief of the Branch. Elsewhere in the Branch, a bacteriologist, with a doctorate in his specialty, was appointed chief of the newly combined Media Preparation and Glassware Sections. New chiefs, both specialists in their fields, were appointed for the Animal Production Section and for the Genetics Research Unit. An electrical engineer with doctoral degrees in law and economics was selected to lead the Instrument Section through its transition to a Branch and to fuller realization of its medical research mission.

The Plant Engineering Branch is placing a competent professional staff in charge of its planning, control, and design functions.

Professional Relations

NIH, through the Sanitary Engineering Branch, co-sponsored the Second Symposium on Gnotobiotic (Germ-free Research) Technology held in May 1959 at Lobund Institute, University of Notre Dame, and through

the Laboratory Aids Branch, helped organize the first Washington, D. C., meeting of the Animal Care Panel. The Division was represented by participation in the National Society for Medical Research Conference on the Legal Environment for Medical Research and by committee membership in the Institute of Laboratory Animal Resources of the National Research Council. The District of Columbia Academy of Medicine held advanced courses in the Animal Hospital.

Scientists from all over the world visited the facilities of the Instrument Section. The recipients of laboratory research project grants and other scientists and technologists are evidencing an increasing interest in visiting Division offices to discuss the design of research laboratory facilities.

Training

A number of Division employees are benefiting from technical training on the job and from specialized courses offered by local universities and industry. The Division is encouraging professional and technical personnel to take advanced training related to their jobs. At year end, the Office of the Chief was in the initial stages of preparing a comprehensive in-training program that will range from courses for newly employed animal caretakers to courses in management techniques for personnel at the supervisory level; the latter is planned for launching some time in 1960. The provision of additional technical training for junior engineers is also planned. In the fall of 1959 a sequel course of instruction was offered to graduates of the 1958-59 technical writing course, and additional writing courses were in the discussion stage. Established during the year and proving highly productive are recurring courses in animal care techniques, for which a special handbook has been developed. The Instrument Section began a series of weekly science seminars on biomedical instrumentation.

Problems

Recruitment

Recruitment, both through Civil Service and the Commissioned Corps, of junior professional engineers for assignments in the Research Facilities and Plant Engineering Branches continues to be a problem. A complicating factor is the apparent reluctance to recruit candidates with a mechanical or electrical engineering background for Public Health Service careers. The recruitment of analytical and physical chemists has become a cause for concern in the Sanitary Engineering Branch, and the Scientific Reports Branch is finding that the disparity existing between Civil Service and industry's salaries threatens the retention of key personnel. Finally, the Statistical Processing Section is experiencing difficulty in recruiting qualified mathematicians.

Impact on Personnel of Reorganization in PEB

The recent reorganization of the Plant Engineering Branch has required a major readjustment in individual and group working relationships among Branch blue-collar employees in the maintenance and construction areas. The need for this readjustment can be expected to continue until the unavoidable disruptions caused by the reorganization have passed and the employees regain their sense of security.

Budgeting Procedures

A. The inflexibility of budgeting procedures persists as a major obstacle to the Division's effort to respond to increases and variations in the needs of NIH research programs. During 1959, however, progress was made in improving the situation. The Statistical Processing Section was put under a fee-for-service system on July 1 and will be placed under the Revolving Fund in FY 1961. Steps were also taken to plan and schedule PEB shop stores and instrument fabrication and engineering for financing under the Revolving Fund in FY 1961. Glassware preparation is scheduled to go on fee-for-service in 1961 for eventual financing by the Revolving Fund.

B. The Division is experiencing difficulty in developing an orderly administrative procedure for budgeting and scheduling major repair and improvement projects. Related to this problem is a lack of flexibility in meeting demands for emergency repair and improvement projects.

Training

Although the groundwork was laid in 1959 for a planned and continuing DRS training program, much remains to be done in this important area. Emphasis will be placed in the coming year on meeting the Division's pressing need for supervisory and job-related training.

Animal Care

Until a number of projected moves and expansion plans take effect, any improvements planned in animal care, cage-washing, and health control will be difficult to achieve without additional space. A 1959 outbreak of infectious respiratory disease in the rabbit colony was definitely attributable to overcrowded conditions in the animal buildings.

ANNUAL REPORT ON RESEARCH PROJECTS

Division of Research Services

Calendar Year 1959

Research is not the primary mission of the Division of Research Services. However, a limited amount of applied research is performed in the Division for the purpose of improving the quality of its services. The success of this effort depends in large measure on the Division's ability to recruit and hold competent research-minded professional people and to provide them with a working climate which permits them to participate closely in the NIH research program.

During 1959, the research of the DRS was associated with the programs in animal production, automatic data processing, and environmental health. Its basic trend was toward improving the quality of technical services provided by DRS and the professional ability of the personnel responsible for providing these services.

Significant accomplishments in these applied research programs consist of the development of two new strains of small laboratory animals, a new surgical technique for the observation of abdominal viscera in animals, new methods of sterilization of foods for germ-free animals by irradiation and gas, and experience in statistical studies of the incidence of various types of cancer in various population groups.

As a result of collaborative studies with an English investigator, earlier concepts of methods for preventing surgical and clinical airborne infections have been modified, a change in preventative procedures has been initiated, and new techniques for measuring infection hazards are being developed.

TABLE OF DRS PROJECTS, 1959

Laboratory Aids Branch

Serial Number	Title
4.1	The Development of a Systematic Method of Breeder Rotation in Non-Inbred Animal Colonies
4.2	Research in Animal Husbandry Practices and Procedures
4.3	Housing and Caging Research and Development
4.4	Development of New Strains and the Introduction of New Strains of Common Laboratory Animals, and the Adaptation of New Wild Species to Laboratory Animal Colony Management
4.5	To Develop a Hybrid Colony of Mice for Use in the Screening of Chemotherapeutic Compounds, in Lieu of One that is Currently in Short Supply
4.6	Animal Caretaker Training Program
4.7	A Line-Operated Power Supply for Movable Anode Transducer Tube
4.8	Automatic Multiple Syringe Drive
4.9	A Coating for Platinum Electrodes to Prevent Polarization
4.10	Automatic Control of Oxygenator Volume Driving Cardiopulmonary Bypass
4.11	Developing a Rapid Skin Grafting Technique
4 12	Complete Removal of the Pineal Body of the Dog

Serial Number	Title
4.13	Complete Surgical Hypophysectomy in Dogs
4.14	Surgical Lengthening of Long Bones in the Dog
4.15	Continued Study in Contrast Radiography
4.16	An Abdominal Window for Viewing the Viscera of a Rabbit
4.17	Therapeutic Applications of Partial Penetrating Keratoplasty in Dogs
4.18	Experimental Production of Vitreous Detachment in Dogs
4.19	Incidence of Blessig-Iwanoff Cystoid Degeneration in Dogs and Cats
4.20	Examination and Observation of Indian Rhesus Monkeys Prior to and During Transport from India to the U. S.
4.21	A Study of Gross and Histopathological Characteristics of Diseases of Rhesus Monkeys Before, During and Following Transport from India to the U. S.
4.22	A Study of the Spread of Tuberculosis from Infected Monkeys to Their Cagemates
4.23	A Study of Gross and Histopathological Characteristics of Diseases of Laboratory, Domestic, and Caged Wild Animals with Surveillance of the Causes of Deaths of Such Animals Quarantined by Animal Hospital Section
4.24	A study of the Naturally Occurring Diseases of Laboratory Animals
4.25	Tattooing of Dogs Used in Medical Research

Biometrics Branch

Serial Number	Title
5.1	Cancer of the Uterus in Jewish and Non-Jewish Females
5.2	Cancer of the Uterus in Negro Females
5.3	Relationship of the Use of Tobacco to Health

Sanitary Engineering Branch

Serial Number	Title
6.1	Evaluation of Gas Sterilization Equipment
6.2	Study of Distilled and Deionized Water Quality
6.3	Germ-Free Systems Research and Development
6.4	Germ-Free Guinea Pig Diet Development
6.5	Evaluation of Detergent-Sanitizer Compounds for Use in the Clinical Center
6.6	Evaluation of Filters in Portable Vacuum Cleaners to Prevent the Redispersion of Viable Organisms in Patient Care Areas
6.7	The Use of Beta Propiolactone for Area Sterilization
6.8	Air-Borne Microbiological Contamination in Selected Patient Environments
6.9	The Effects of Ventilation and Other Variables in the Bacteriological Quality of Air at the Surgical Wound Site

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

DIVISION OF RESEARCH SERVICES

Summary of Branch Activities

1. DRS-2
Serial Number

2. PLANT ENGINEERING BRANCH

3. R. R. Holliday
Branch Chief

Objectives

The objectives of the Plant Engineering Branch are to provide three major central services. These are:

Operation and Maintenance -- These services consist of operating, maintaining and repairing the physical, mechanical, electrical, architectural and landscaping facilities of the NIH, as well as maintaining and repairing laboratory and research apparatus.

Engineering Services -- These services consist of developing and preparing plans and specifications for alterations, repairs and extensions to the existing facilities, administering and inspecting construction work performed by private contractors, and providing consultant and technical engineering services for development of new facilities and research apparatus.

Construction Services -- These services consist of altering, installing and fabricating facilities and equipment for research programs. In this capacity the Branch furnishes mechanical, electrical and architectural crafts services.

These services are provided by the five sections of the Branch and the Office of the Chief. The five sections are: Planning and Control, Engineering Design, Maintenance Engineering, Shops, and Grounds Maintenance and Landscaping.

PLANNING AND CONTROL SECTION: Responsible for the planning and control of all PEB work including receipt, review, classification, estimating, scheduling and routing; for the continuous inspection of the National Institutes of Health facilities; for the review, recommendation and justification required in the funding of maintenance and repair, and alteration and construction; for the administration and inspection of all work performed by outside contracting firms; and for the administration, operation and control of the Branch Shop Stores.

ENGINEERING DESIGN SECTION: Responsible for matters pertaining to engineering studies and reports; engineering design, including development of plans and specifications; and the maintenance of the Plant Engineering Branch technical plan files and records.

MAINTENANCE ENGINEERING SECTION: Responsible for administration and for the operation, operational maintenance, trouble shooting, and operator inspection of the heating plants, refrigeration plants, incinerator plant, substation, building mechanical-electrical equipment and systems, including air conditioning, pumping, communications, elevators, can wash equipment, laundry, etc. Also electric, water, steam, sanitary, air, gas, chilled water, distilled water, and fuel oil distribution systems.

SHOPS SECTION: Responsible for administration and operation of the craft shops engaged in performing maintenance and repair, and alteration and construction for all of the NIH except that performed by private contractors.

GROUNDS MAINTENANCE AND LANDSCAPING SECTION: Designs new landscaping for the NIH Reservation and provides professional consultation. Maintains, develops and renovates the grounds of the Reservation including woodland, lawns, shrubbery, trees, flowers and ground cover material, station roads, service areas, parking lots and walks (including snow removal and ice control). Responsible for maintaining and operating equipment required for such work as excavation, concrete removal and light and heavy rigging. Maintains indoor plantings in various buildings of the Reservation and supplies other ornamentations appropriate to the various occasions and/or seasons.

Accomplishments

REGULAR WORKLOAD

Alterations and Construction - The shops completed 5068 alteration and construction jobs for the NIH Institutes and Divisions during the first eleven months of the year. This work required 98,371 manhours which cost approximately $334,461.00. The material costs for this work were $163,951.00.

Maintenance - The Branch operated, maintained and repaired the following facilities:

1. Medical research and service buildings having gross floor space of 2,681,500 square feet. The supporting utilities including major utility plants for heating, air conditioning and incineration.
2. 307 acres of landscaped grounds.
3. 5 miles of paved roads.
4. 4650 linear feet of sidewalks.
5. 16.43 acres of parking lots.

During the first eleven months of the year, the Branch completed

10,224 specific projects identifiable to maintenance and repair. This work required 312,047 manhours which cost approximately $1,060,960. The material costs for this work were $176,230.00.

Engineering Design - In addition to engineering devoted to work performed by the Plant Engineering Branch Shops, new building construction and special engineering studies, plans and specifications were prepared during the first eleven months of the year for 89 projects performed by outside contractors. The total construction cost of these projects is estimated at $789,677.00.

Contract Administration - The Branch administered and inspected 106 NIH construction contracts during the year. These projects cost a total of $1,066,223.00.

In addition, the Branch inspected and assisted the Regional Office, Public Buildings Service, with the administration of 12 repair and improvement projects contracted for NIH. The cost of these 12 projects was $543,759.00.

STUDIES AND SURVEYS The following research studies and surveys were made by the Engineering Design Section during the first eleven months of the year:

Laboratory Furniture - Further revision has been made of PEB standard laboratory furniture specifications used for NIH stock procurement and for contract installation. These revisions included removal of conflicts with industry practices, but were especially designed to promote increased procurement economies, quicker deliveries, and integration with the new PEB Shop Stores program. These specifications were written around the format used for Standard Federal Specifications. In the new form the specifications will be used to procure items directly from the source of manufacture. Previously our ordering procedure and specification had been integrated in a manner which required subcontracting of orders, increasing costs and delivery time.

Partitions - A long standing need for an economical and versatile demountable partition for use in non-laboratory areas was satisfied during the year. After investigation of several types, EDS has found a 2" thick metal partition, made in production by a leading partition manufacturer, to be best suited to the overall requirements of NIH.

The partition is made of panels 2" thick and 1'0" wide, made to any length desired. The panel is faced with sheet metal on each side of a core of honeycomb paper. The panels fasten together in a tongue and groove fashion, and are completely salvageable. They can be hand tooled on the site to meet any custom requirements, utilizing semi-skilled labor and ordinary hand tools or common power tools. This thin weight and size make them easy to handle by one person during stocking or fabrication procedures.

EDS was successful, with the cooperation of other groups in DRS, in getting this partition specified and accepted for use in the new Office Building, Building #31. Where installations have already been completed, the partition has been favorably received by both the installers and users of the space.

Building Surveys - In anticipation of extensive movement of NIH personnel and laboratories brought about by completion of new buildings on the reservation, surveys and cost estimates were completed involving comprehensive alteration and rehabilitation of the interior construction features and mechanical-electrical services of Buildings 5 and 8. These studies included the feasibility of adding another floor and roof to Building 8.

Plastic Ductwork and Piping - A study was conducted to determine the feasibility of using plastics for conveying waste acid-solvent fumes and solutions. Polyvinyl chloride plastic for ductwork and fan construction and polyethylene for piping were considered to have the best corrosive-resistant qualities of the economically acceptable materials studied.

Arrangements were made with leading manufacturers to demonstrate the characteristics and fabrication of their products to the interested personnel in PEB. Material of both types has been ordered and will be installed as a test installation on an acid kettle project in Building 6.

Floor Covering - A study was conducted to find better floor covering of the sprayed or painted-on nature. Cleanability, resistance to abrasion and ability to be decontaminated where radioactive materials are used, are the desired characteristics. Some products having good possibilities have been applied to sample areas at NIH and are presently in the testing period.

Assignment Drawings - "Assignment" floor plans of all NIH buildings were brought up-to-date. To accomplish this three college student trainees were hired as draftsmen on a temporary basis. Up-to-date "assignment" drawings are needed to reflect the current general arrangement, size and relationship of spaces within the buildings. These drawings are made available by PEB to the Institutes and Divisions to plan space allocations and rearrangements for their programs and functions.

GROUNDS AND LANDSCAPING

General: An overall picture of growing conditions for the year will help in understanding some of the results achieved or not achieved.

We began the year with far below normal soil moisture reserves. This was caused by a lack of snowfall the previous winter and the almost continual frozen surface that caused rainfall to run off instead of percolating into the soil.

Many of our larger trees were and are still suffering from the effects of the severe drought of the summer of 1957. The response of the large trees to abnormal weather is often delayed (as much as 3 years or more), whereas grass and shrubs will respond to weather conditions very quickly.

Below normal rainfall and several prolonged periods of high temperatures following a severe winter made the year of 1959 a poor one for ornamental horticulture.

We are now entering the winter months with dry subsoil and badly need slow melting snows to help replenish soil moisture.

Lawns - We started lawn growing with our fine lawns in the best shape ever. Our outlying lawns were recovering from a severe burn from an overdose of the wrong fertilizer, mistakenly applied by a contractor. A program of top dressing and reseeding had these outlying areas well on the way to recovery at the beginning of this season.

Frequent light rains early in the season kept the turf beautiful but did not build any appreciable soil moisture reserve so that when we encountered an unseasonably hot, dry period in June, the permanent grasses went dormant. This gave crab grass the opportunity to get through and run wild. The best protection against crab grass is a strong healthy turf clipped at a 2 inch minimum height.

The poor weather conditions forced us into an extensive lawn renovation program this fall during one of the hottest, dryest Septembers on record. The new seed germinated but did not make much growth; however, it will survive a normal winter and should begin vigorous growth next spring.

A soil conditioning program aimed at improving soil moisture retaining properties, fertility, and insect and rodent control was continued this year. This program consists of:

1. Applying approximately 70 tons of commercial fertilizer each year.
2. Applying 150 cubic yards of top dressing material, in a progression, so that our fine lawns will be top dressed at least once every three years.
3. Aerifying all lawns once each season to a depth of three inches.
4. Chlordane application to control Japanese beetle grubs (that feed on grass and roots and later as adults feed on foliage), ants, termites, miscellaneous grubs and moles. One application of Chlordane is effective for approximately 4 years.

so we cover approximately one-fourth of our lawn areas each year.

Trees and Shrubs - Our large tree maintenance program is at a standstill for lack of a unit head. Various approaches, within the framework of personnel policies, have been tried. We are now awaiting word from applicants who seem interested in the job. Our large trees are suffering badly from dry soil and need much severe pruning and surgery to help them. At present we are doing only emergency maintenance work in this area.

Smaller trees and shrubs are in much better shape since we are able to water and feed them. A mulching program has helped considerably to conserve moisture and eliminate weeds (hand work) on these smaller plants. The mulch we make ourselves by chipping brush and pruning debris and mixing this with sawdust that we obtain free for hauling. We applied approximately 500 cubic yards of this mulch material this year.

We salvaged more than 500 shrubs and 32 trees from construction sites and relocated these plants at various areas about the reservation.

Streets, Walks and Parking - Major street and walk repair and maintenance has been kept to a minimum this year mainly because of new building construction which necessitates heavy hauling over many of our streets. This hauling is slowly breaking up our streets and to spend time and materials except where absolutely necessary is not practical until this heavy traffic has subsided somewhat.

We are continuing a program of sealing bituminous parking areas with coal tar pitch emulsion once every four years to slow surface deterioration from gasoline, oils, greases and weather.

The increase in paved areas forced us to find better methods and procedures of handling snow and ice conditions. We are increasing the use of rock salt on paved areas with curbs, to combat ice and light snows. This allows us to cut down on sanding operations considerably, thereby keeping our streets and storm drainage system cleaner and cutting down on overtime by speeding up the operation. A non-toxic snow remover for sidewalks is being used with success.

For heavier snows, we recommended and received approval for a parking ban on all streets after normal working hours. This allows us to plow streets all to one side thereby keeping the sidewalk on the opposite side free from huge piles of plowed snow. This should also improve public relations, since we will not be forced to pile snow tightly against cars parked at the curb.

Sanding, salting and plowing operations for streets and walks are all planned and divided into routes. These routes are laid out on plot plans and posted in our ready room. Typed descriptions of

these routes are carried in the various vehicles. During regular working hours each foreman is responsible for a given area. At night or on week-ends, as a man reports, he picks up his route from a board in the ready room, checks it off by filling in his name and moves right on out to work.

We have altered several garden tractors and lawn mowers so we can use them as sidewalk plows to speed up this work.

Erosion Control - The creeks located on the reservation and many steep slopes sown in grass presented a knotty problem for maintenance. These areas were maintained by slow laborious hand work and never looked neat even when just finished. This year we began a program aimed at eliminating as many of these areas as possible. The following has been accomplished:

1. The shrubs that we have salvaged from new building construction areas were used as mass slope plantings on steep slopes near Building No. 21, and along the convent fence. A mulch of chips beneath these shrubs helps cut down on erosion.

   In the future we plan to plant more of these slopes in dense shrubbery and to construct dry stone retaining walls to soften these slopes. We have salvaged most of the stone necessary from the Library of Medicine excavation site.

2. Many storm sewer outfalls were located far back from the creeks. This created an unsightly, hard to maintain, ditch from outfall to creek. We are knocking out these old headwalls and extending the drain pipe to creek edge. Four of these drains have been completed. Five are to be completed this coming year.

3. The large creek that runs through NIH property from Glenbrook to Wisconsin Avenue at Cedar Lane, has been a maintenance problem for some time. A proposal to pipe this creek was rejected because (a) an approximate cost of $200,000 was not justifiable and (b) the aesthetic beauty of this stream would be completely destroyed. At the beginning of the year this creek was very crooked, flooded the flat area frequently at Building 21 and was eroding beneath East Drive at one point. We studied this problem and decided on the following program:

   a. The creek would be straightened to gradual curves to avoid erosion and to allow faster carry-off of runoff water from rapidly increasing paved and building areas.

   b. The bed would be regraded to a smooth even grade

to eliminate many deep holes and shallow flooding areas.

c. The banks would be graded back on a shallow curve to hold a larger volume of flash runoff without flooding and to allow mowing equipment to operate within inches of the normal water level.

d. A wall would be built at the large storm sewer outfall east of Building 3 to turn the creek and help prevent flooding of a proposed parking area at Building 21.

e. A new foot bridge would be needed to connect this parking area with Building 1 area.

This entire project has been accomplished this year from the west property line at Glenbrook to the bridge at North Drive, (T-6). In some places the creek bed was raised as much as 5 feet. Stone and masonary, by-products of construction jobs, were used for this job. The turning wall east of Building 3 was constructed of old curbstones and the foot bridge was built from locust and cedar that were blown down in a heavy windstorm. The slopes were fine graded and seeded to lawn that has responded very well.

At least two record flash rains occurred late in the summer. We were able to contain this runoff using only an estimated 60% of capacity.

The project will be completed to Wisconsin Avenue after the new office building area is completed.

Master Landscape Plan - Planting plans and specifications have been prepared and are on file in GM&L office for the following areas:

1. Screen planting - Glenbrook Community and NIH service building area.

2. Screen planting between buildings T-18, T-19 and surplus storage yard, tree and shrub planting for T-18 and T-19.

3. Screen planting between new Cedar Lane and station residences.

4. Foundation plantings for all station residences.

Planting plans are scheduled to be prepared as time permits this winter for:

1. All entrances to the reservation.

2. The older buildings group - 1 through 9.

3. Base plantings for proposed new NIH entrance signs.

4. Slope plantings and retaining walls for steep areas.

5. Plans are being worked out presently for a naturalistic rock structure to furnish a spring and cascade type formation at the large pools at main entrance to Clinical Center. This area has never been completed mainly because of controversy over the statuary that has been suggested. We hope this will, when presented, solve this problem. This construction will add beauty to this unfinished area.

When the above mentioned plans are complete, all plans will be consolidated into a master landscaping plan.

MASTER PLAN FOR NIH UTILITY SYSTEMS Prior to this year, there was no master plan for systematically developing and extending the central utilities required for new buildings. Without such a plan, utilities for new buildings were connected to the nearest existing utility. This procedure resulted in dangerously overloading some utilities.

During the calendar year 1958, funds were made available from the PBS Repair and Improvement program, to have master utility plans prepared.

In March of this year, a contract was given to the consulting firm of H. D. Nottingham and Associates to prepare the plans. The contract called for a complete master plan, projecting the utilities to accommodate all existing and authorized buildings and all future buildings as shown by Master NIH Building Plot Plan Drawing No. 2332.

Utilities included were:

1. Chilled water distribution system.

2. Steam distribution system.

3. Central refrigeration plant.

4. Gas distribution system.

5. Electrical distribution system.

6. Fire alarm and watchmen report systems.

Intermediate reports have been prepared on all utilities. These are currently being reviewed by PBS and NIH. The final drafts should be completed early in calendar year 1960.

The study uncovered major deficiencies in (1) the electrical distribution system (2) the fire alarm and watchman report systems and (3) the steam distribution system.

Recommendations for correcting these deficiencies were reported to the Director NIH by the Chief DRS in memorandum of October 21, 1959.

NIH BUILDINGS AND GROUNDS MANUAL Initial efforts to develop a manual containing comprehensive data on NIH Buildings and Grounds were started approximately two years ago.

The manual was completed during the month of September 1959. Many people contributed to the development of the manual. Some were:

1. Personnel of practically all Sections of PEB.

2. Personnel of the Management Analysis Branch, OAM.

3. Personnel of the Division of Research Services.

The manual contains three volumes which present historical records of the NIH reservation and a current description of the buildings and grounds. Volume I describes the methods of acquisition of NIH real property, includes an aerial photograph and plot plan of the reservation, reports the cost of each building, describes the general utility services on the reservation and describes Buildings 1 through 9. Volume II describes Buildings 10 through 14. Volume III describes Buildings 15A through 28.

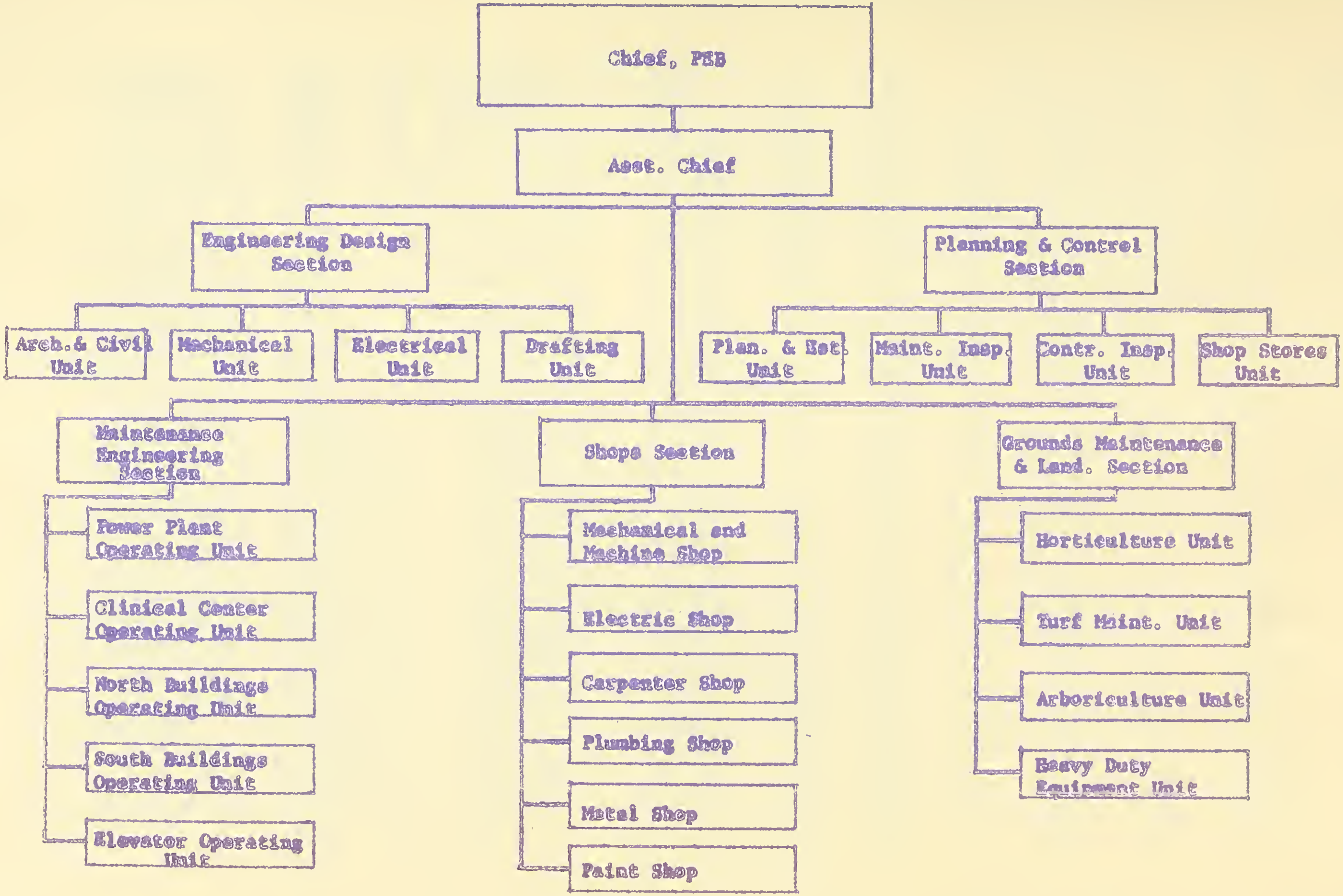
Changes and Improvements

REORGANIZATION OF THE BRANCH A complete reorganization of the Plant Engineering Branch to unit levels was completed in October of this year. The new organizational chart is shown on the next page.

The reorganization was necessary to adjust to the increased demands for service created by the rapid growth of NIH.

The new organization consolidates like functions within single organizational components and establishes more clearly the lines of responsibility. It was designed to accommodate the Controlled Maintenance System we are installing, which is explained elsewhere in this report.

The Planning and Control Section provides, with its Planning and Estimating Unit, a central point for receiving and authorizing all work performed by the Branch. This unit also plans for and estimates the manhours and material requirements for each specific job in advance, which permits advanced scheduling of each job by craft.


Chief, PEB
Asst. Chief
Engineering Design Section
Arch. & Civil Unit
Mechanical Unit
Electrical Unit
Drafting Unit
Planning & Control Section
Plan. & Est. Unit
Maint. Insp. Unit
Contr. Insp. Unit
Shop Stores Unit
Maintenance Engineering Section
Power Plant Operating Unit
Clinical Center Operating Unit
North Buildings Operating Unit
South Buildings Operating Unit
Elevator Operating Unit
Shops Section
Mechanical and Machine Shop
Electric Shop
Carpenter Shop
Plumbing Shop
Metal Shop
Paint Shop
Grounds Maintenance & Land. Section
Horticulture Unit
Turf Maint. Unit
Arboriculture Unit
Heavy Duty Equipment Unit

The Maintenance Inspection Unit serves to develop maintenance standards and control the generation of maintenance work. Many of the inspections are made by personnel in other organizational components of the Branch as scheduled by this unit.

The Contract Inspection Unit consolidates under single management the administration and inspection of all construction work performed by outside contractors.

The Shop Stores Unit also consolidates under single management the operation of the consolidated shops storeroom and the inventory control and accounting of all PEB stores stock.

The Engineering Design Section is the central point for providing engineering designs, studies and reports.

The Maintenance Engineering Section centralizes the responsibility for operation and servicing of all utility plants and distribution systems and receives and handles service and trouble calls.

The Shops Section is a complex of craft shops engaged in performing maintenance and repair, and alteration and construction for all NIH except the work performed by private contractors.

The Grounds Maintenance and Landscaping Section is the only organizational component of the Branch which has not been changed. The section designs new landscaping, cares for the grounds and roadways and provides laboring services for other sections of the Branch.

Staffing of the Planning and Estimating Unit and the Maintenance Inspection Unit of the Planning and Control Section has not been completed; the units are in limited operation. Some changes are yet to be made in some of the larger units of other sections. Staffing and unit organizational changes will be planned and implemented with the planning and installation of the Controlled Maintenance System.

CONSOLIDATION OF PEB CRAFT SHOPS

A study of this program was initiated in 1957 with the assistance of the consultant firm of A. T. Kearney and Company. As a result of the study, it was decided to physically consolidate the PEB Shops on the first floor of Building 13. These shops were originally located on four different floors of the building.

Implementation of the shop consolidation plan began in 1958. The plan for consolidating PEB shops included moving the Instrument Shop and other activities of the Instrument Section, LAB, to the third floor, Building 13. Plant layout studies were completed for new arrangements of offices, machine tools and equipment for both the PEB shops and the LAB activities. Two PEB shops originally located on the third floor of Building 13 were temporarily relocated

to the second floor, and the third floor area was completely renovated for LAB activities. Concurrently, space originally occupied by the Plumbing Shop adjacent to PEB offices on the ground floor was renovated to provide additional PEB office space. The Plumbing Shop was temporarily relocated to space on the first floor originally occupied by the Instrument Shop.

Plans and specifications for the renovations required to consolidate the PEB shops on the first floor, Building 13, were completed during calendar year 1958. A contract was awarded for renovating the space to be occupied by the shops in April of this year.

The renovations and moving of the shops was completed, except for minor details, in November of this year. The new arrangement provides the following advantages:

1. Makes management of the consolidated shops easier.
2. Makes possible improvements in shop operation and effectiveness.
3. Permits reduction in shop operating costs.
4. Saves space.

DEVELOPMENT OF A SHOP STORES MANAGEMENT SYSTEM

A report entitled "Study of Maintenance Shops and Stores", completed December 6, 1957, by the management consulting firm of A. T. Kearney and Company, recommended that the then separate PEB shop stores be physically consolidated and placed under modern procedures of inventory and storeroom control. The study indicated that the Branch had in stock an average of 17.4 months supply of shop stores material, representing an investment of $439,800 and occupying 16,300 square feet of space. It was estimated that inventories could be reduced to an average six months supply, representing a $242,000 reduction in stock investment. Floor space could be reduced in proportion.

In January 1958, management of the PEB shop stores, which previously had been under administrative control of the respective shops to which they were attached, was consolidated into a single organization. In June of 1958, A. T. Kearney and Company was retained on contract to assist in the development and installation of new stock control and management procedures.

A more detailed analysis of stock material was made, which indicated that existing stock consisted of 12,590 separate line items, having a total inventory value of $435,550. New guide lines and control factors were developed to permit initial reduction in the number of line items to 6,550, having an average inventory of $116,600; a total inventory reduction of approximately $318,950,

and a saving of approximately $32,000 per year in carrying costs. (The above figures exclude construction materials financed through the NIH revolving fund).

As of the end of 1959, implementation of the new Shop Stores System was approximately 90% completed. During the year, shop stores stock was first merged into two temporary storeroom areas during renovation of the former Sheet Metal Shop area, after which the material was moved to its final location in a single, consolidated storeroom. Preparation of storage space for Revolving Fund material was completed. This material (laboratory cabinets, fume hoods, sinks, etc.) presently is required to be physically separated from all other stock.

Development of detailed operating procedures was completed, including completion of the "Shop Stores System Manual of Procedures" prepared by A. T. Kearney and Company, as part of their contract. Bundling and bagging of stock in appropriate control quantities, design, approval and procurement of special forms, supplies and office equipment was accomplished, and operation under the new control procedures was begun May 18, 1959. Experience gained from the first few months of operations permitted completion of management control procedures, which will be added as the final chapter of the manual of procedures.

Shop stores items scheduled for implementation during 1960 required to round out the program are as follows:

1. Bring material presently financed under the NIH Revolving Fund (laboratory cabinets, fume hoods, sinks, etc.) under the new stock control procedures. These items will be controlled and procured on an individual line-item basis, rather than under a whole category as in the past.

2. Develop material specifications for continuing use for procurement of items of specialized equipment. A preliminary specification has been completed and used for a trial procurement of laboratory cabinets.

3. Develop and maintain an adequate PEB Shop Stores Catalog.

4. Develop revised and simplified storeroom requisitioning procedures made feasible largely as a result of the recent shift in statistical processing work to the Model 650 computer. This includes putting into use a new storeroom requisition, preliminary design of which has been completed, to replace four documents now in use.

5. Coordinate requirements for standby stock items with the revised requirements as they are developed by the preventive maintenance procedures now being implemented under the Controlled Maintenance Program.

6. Complete personnel staffing, including personnel actions not completed for present personnel, plus setting up a cataloging and special material ordering group.

7. It has been proposed that the entire PEB Shop Stores System be placed under NIH Revolving Fund financing, to be effective July 1, 1960. If a firm decision on this is reached, considerable effort will be required during the early months of 1960 to complete the detailed program planning before the effective date.

8. Establish pre-expended bins in the shop areas for frequently-used, low-value items.

9. Consolidate the presently separate satellite storerooms in Building 10. The support mission of these storerooms will be changed as a result of a decision to eliminate craft shop sub-headquarters in this building.

10. Provide space in Building 13, and bring under effective storeroom control, the construction materials now stored in Buildings 11 and 12.

DEVELOPMENT OF A CONTROLLED MAINTENANCE PROGRAM

As part of the general reorganization of the Plant Engineering Branch, the nucleous of a central control point was established during 1958 for planning, estimating and scheduling the work of the Branch. During the first year of operation, all construction and alteration work (maintenance work was excluded) was processed through the central point, called the Project Control Office, as a result of which a substantial reduction was made in the average time between receipt and completion of projects.

Experience gained through operation of the Project Control Office led to the early conclusion that all work of the Branch, including maintenance, should be placed under modern management procedures. A decision was reached to obtain the services of an outside consultant to assist in establishing detailed procedures, and Contract No. SA-43-ph-3482 was awarded for this purpose to A. T. Kearney and Company, Chicago, Illinois, on June 29, 1959. The program is referred to as the Controlled Maintenance Program, the term usually used in private industry and some government agencies where these management techniques have been adopted.

Planning of the Controlled Maintenance Program was begun immediately after award of the contract to A. T. Kearney and Company. The general scope of the program is as follows:

1. Initial Survey - Conduct a survey of the present mission, requirements and detailed procedures of the Plant Engineering Branch for planning and accomplishing

maintenance and other assigned work.

2. Recommendations - Develop recommendations for the policies, staffing and duties required for a system of controlled maintenance of facilities, based on the following elements:

   a. Systematic and continuous inspection of all parts of the facilities.

   b. Detailed planning and estimating of all major work.

   c. Advance scheduling.

   d. Coordination of the availability of materials, equipment, manpower, tools, etc.

   e. Ready access to management of all pertinent data on manpower, costs, material and backlog of work.

3. Work Control Center - Within the framework of the approved policies and planned staffing, establish a work control center in the Plant Engineering Branch, including the following specific tasks:

   a. Develop the policies and procedures as required to receive, review, classify, authorize, route and record all work, including defining and establishing categories and types of work orders.

   b. Develop and install an appropriate work order numbering system and simple internal cost accounting system in terms of labor and material.

   c. Develop and install a system for accurately determining and recording the man-hours devoted to specific jobs, standing work orders, projects and other categories of work.

   d. Collect and record the data required to establish work standards by statistical analysis; analyze the data and establish the standards.

   e. Develop and install procedures for applying the work standards for labor loading, control, and backlog reporting, including the development and application of additional techniques such as estimating to supplement the work standards.

   f. Develop and install the procedures for weekly scheduling of major jobs by shop crafts, including the application of operating procedures and data

generated in the system to provide general indicators of work performance by craft.

g. Develop management reports as required and establish procedures for their preparation and use.

h. Establish the guides and methods for auditing the system to insure its continued effectiveness.

4. Preventive Maintenance - Within the framework of the approved policies, objectives and planned staffing, develop preventive maintenance procedures, including the following specific tasks:

   a. Develop the policies and procedures for determining what facilities and items of equipment are to be inspected, and direct the preparation of detailed listings of items by categories, such as buildings and components, electrical, mechanical, etc.

   b. Develop the procedures for determining what is to be inspected for, frequency of inspection, etc.; apply the findings to the detailed facility listings and record the data in usable form as a master inspection guide.

   c. Develop and install the procedures for preparing an inspection schedule from the master inspection guide to provide the means for initiating the actual inspections and accomplishing routine maintenance work.

   d. Integrate the preventive maintenance procedures into the over-all Controlled Maintenance Program, including development of procedures to spell out who will inspect, inspection routes, inspection methods, auditing and control reports.

Work on this program completed during 1959 was as follows:

1. Initial survey completed. Basic recommendations as to required organization and staffing developed and approved.

2. Expanded central control center established, known as the Planning and Control Section.

3. All major management decisions required for implementation of the program in the construction shops (Shops Section) have been made and interim procedures manual completed.

4. Basic forms have been designed and submitted for forms approval and printing.

5. Basic preventive maintenance policies have been adopted and preliminary listing of facility items completed and reviewed.

6. Position descriptions for key personnel have been prepared and submitted for grade allocation. This includes some types of positions new to NIH, such as planner and estimator, shop planner and shop dispatcher. A person experienced in controlled maintenance work was recruited to serve as Chief, Planning and Control Section.

Further implementation of the Controlled Maintenance Program scheduled for 1960 is as follows:

1. Begin processing all work performed by the Shops Section under the interim procedures. Starting date for this phase will depend upon completion of personnel actions and recruitment of key personnel.

2. Extend operations under Controlled Maintenance Procedures to the Maintenance Engineering Section and Grounds Maintenance Section.

3. Develop final manual of procedures, based on experience gained during installation period.

4. Develop detailed facility history records, inspection schedules and inspection check lists; begin making formal preventive maintenance and control inspections.

5. Develop management control procedures to measure the effectiveness of the program.

6. Complete staffing and training of key personnel.

Target date for completing the installation of the Controlled Maintenance Program is December 31, 1960.

TRAINING Training given outside the Branch for personnel of the Branch during the year is listed below:

Conferences on Supervision:

Given at NIH
12 sessions - 2 hours per session
16 supervisors attended

Maintenance Conferences

Given at Wright Patterson Air Force Base, Dayton, Ohio
4 days, 8 hours per day, 5 employees attended

Technical Writing Course

Given at NIH
15 sessions, 2 hours per session, 5 employees attended

Negotiated Contracting

Given at NIH
8 sessions, 1-1/2 hours per session, 3 employees attended

Refresher Course in System Analysis

Given at American University
8 days, 8 hours per day, 1 employee attended

Personnel Management

Given at Army Map Service
5 days, 8 hours per day, 1 employee attended

Advanced Technical Writing Course

Given at NIH
16 sessions, 2 hours per session, 5 employees attended

Operation of the IRD Vibration Analyzer

Given at the International Research & Development Corp.,
Worthington, Ohio
3 days, 8 hours per day, 6 operating engineers attended

Solution of Control & Air Distribution Problems Primarily Associated with Central Air Handling Systems

Given at Barber-Coleman Co., Rockford, Illinois
4 days, 8 hours per day, 1 Mechanical Engineer attended

In addition to the above, training was given the operating engineers and some electricians by supervisors of the Branch. The operating engineers received two types of technical training: (1) formal classroom instruction and (2) on-the-job instruction.

Formal Classroom Training - This program is aimed at developing advanced skills rather than the basic and intermediate training incorporated in the usual apprentice-training program. Personnel are exposed to intensive instruction in some phase of their activities. This training has taken the form of lectures, slide projections on screen, visual aids, or visits by suppliers who provide instruction concerning their products. The course content is governed principally by the immediate needs of the organization. For example, the operating engineers receive intensive training in the more complex, recently installed air conditioning and refrigeration equipment

The classes are held from 3:00 P.M. to 5:00 P.M., one day each week. This arrangement provides that the training is given during one hour of Government time and one hour of employee's time. (Operating engineers work from 8:00 A.M. to 4:00 P.M.) Attendance at the courses is entirely voluntary. The identical course must be conducted 3 or 4 times to provide each man the opportunity to attend without interfering with his regular shift assignment or off-duty hours.

On-the-job Instruction - Before a new employee is assigned to regular shift positions, he is assigned to work with an experienced operating engineer. The new employee learns by exposure to the job and instructions given him by the experienced man.

The length of time new employees remain in a training status depends largely on the employee's grade level and prior experience. The usual assignment does not exceed 30 days. During this period the new employee is rotated among several experienced operating engineers. The engineers providing the training report employee's progress to Unit Head for review.

Formal classroom training given electricians was as follows:

1. High Tension Distribution and Transformers

   9 hours for 7 electricians

2. Electrical Code Requirements

   12 hours for 12 electricians

3. Instruction on Special Equipment at NIH

   10 hours for 6 electricians

PERSONNEL RECRUITMENT Recruitment of professional engineers during the year continued to be difficult. Eight engineers GS-9 and above were employed during the year for design, inspection and supervision.

Problems

BUDGET Capital For Construction Work. The Branch does not have a satisfactory system for financing the procurement of materials for alteration and construction projects done for the NIH Institutes and Divisions, by the Branch.

Funds for these materials are advanced to the Branch as part of the operating budget. The funds advanced are recovered from the Institute and Division budgets after the work has been completed. Materials used for maintenance, of course, are financed from the

Branch operating budget.

The same types of materials used for maintenance work are used for alteration and construction work. Therefore it is not feasible to separate the procurement and handling of maintenance materials from construction materials.

The demands for construction materials vary. Consequently, since all materials are financed from the Branch operating budget, capital periodically needed to replace materials used on construction work temporarily depletes capital needed to finance the operation of the Branch.

To correct this problem we are endeavoring to capitalize the PEB Stores, and finance their operation from the NIH Revolving Fund.

Funds For Repair and Improvement Work - The majority of funds for major repair and improvement projects are provided by Region 3, Public Buildings Service. These funds are made available in varying amounts unrelated to the actual needs.

Approximately $372,000 was provided for fiscal year 1958; approximately $410,000 for fiscal year 1959; and approximately $60,000 is available for fiscal year 1960.

Programing and performing systematic maintenance and repair can not be accomplished unless an adequate and reliable system of financing is established. Efforts in this direction are continuing.

December 1959 Calendar Year 1959

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

DIVISION OF RESEARCH SERVICES

Summary of Branch Activities

1. DRS-3
Serial Number

2. SCIENTIFIC REPORTS BRANCH
Branch

3. Taft S. Feiman
Branch Chief

Objectives

Branch objectives are to provide central services in visual communication and publishing to the Institutes and Divisions. These services are indicated by the Branch's organizational units, which are as follows: Library Section (including the Translating Unit), Medical Arts Section, Photography Section, Editorial Section, Publications and Reports Section, and the Office of the Chief.

Programs

Library Section

Provides a prompt and comprehensive supply of pertinent information to NIH scientists and to investigators elsewhere.

Assists the individual scientist in keeping currently informed not only on the antecedents of his experimental work but also in the rapidly accumulating knowledge in his own field.

Provides educational materials for formal and informal on-the-job training and education.

Provides material needed by technologists and program staff who support the scientific programs of NIH.

Provides advice on matters relating to information storage and retrieval.

Translating Unit

Translates and loans translations from 20 languages into English as well as translations from the English language into French, Spanish, German, Italian, and Japanese.

Russian Scientific Translation Program

Reports on current medical research in the USSR through abstracts and reviews, and in extenso translations of Russian journals and books.

Provides background information on Russian medical research to assist American scientists in evaluating status and quality of Russian medical research.

Medical Arts Section

Provides a variety of central graphic services for the NIH scientific staff, such as statistical charts and drawings.

Designs, constructs, schedules, and ships research exhibits.

Prepares general, technical, and medical illustrations for use in lectures, scientific publications, and exhibits, and for administrative, informational, and teaching purposes.

Develops visual and functional tools, such as plastic and wax models, to assist the scientific staff at NIH.

Photography Section

Provides black-and-white and color photographs, photostats, xerography multiliths, photomicrographs, slides, transparencies, and motion pictures to illustrate, document, and validate research, both in the presentation of scientific reports and in general information concerning NIH research accomplishments, and events of public information significance.

Investigates potential photographic techniques and equipment that may contribute to the solution of special research problems. Consults on and recommends new equipment or procedures that may improve documentation of research results.

Designs special photographic equipment or adapts existing types to fit specific production or research problems.

Provides consultation to research scientists on technical difficulties and problems in the field of photography.

Editorial Section

Offers broad editorial services and editorial analyses (on request) to NIH scientists preparing papers for presentation or publication, and to information officers and others associated with the preparation and use of NIH publications.

Serves as NIH focal point for recording and approving scientific papers, speeches, abstracts, press releases, announcements, radio and television materials, exhibit and publication copy, and all other written informational materials directed to the professional and general public.

Screens the scientific literature, retrieving NIH titles for the use of information personnel.

Prepares the annual NIH bibliography.

Publications and Reports Section

Provides a variety of central information services for NIH.

Publishes the NIH Record and the Calendar of Events.

Prepares special articles, scripts, speeches, and press releases.

Through central photo, slide, and publication libraries, supplies NIH staff with published or illustrative materials for lectures, various professional publications, and for newspaper, magazine, television, and other popular media of communication.

Performs specialized binding, distribution, and varityping services for the NIH staff.

Office of the Chief

Supplies public and professional information services for the Division of Research Services, typographical and editorial review of NIH publications for the Office of Research Information, and provides consultation and technical advice concerning problems in publications and publishing, printing, information retrieval and other visual communication services to NIH staff.

Progress and Accomplishments

OFFICE OF THE CHIEF Library Personnel. John Clopine, in charge of readers' services of the DHEW Library was appointed NIH Librarian on June 28, 1959, succeeding Scott Adams who transferred to the National Science Foundation on March 1. Mr. Clopine's selection came from a list of more than 20 candidates, all well known in the professional library field, who were interviewed by SRB, DRS and the NIH Library Advisory Committee.

Library Security. Progress was made on the SRB plans for protecting the Library book collection. Material for partitions and paneling arrived late in 1959 and installation hinged on repainting. After installation, the Library will be in a better position to provide monitoring of its collection at all hours and a charge-out system, both day and night, and probably on weekends will be put into effect. Also, late in 1959 plans aimed at the solving of the photocopy problems of the Library were formulated. When effected, the need by users for taking journals out of the collection will be reduced, since most material will be easily photocopied. Similarly, mutilation of journals and books may come to an end when it is realized that these pages can be copied with hardly any loss of time.

NIH Record Enlarged. SRB plans for enlargement of the NIH Record and for letterpress reproduction were approved at PHS and DHEW in 1959 and the new NIH Record was produced and distributed on November 10, despite understaffing caused by transfer of one employee. The new Record now contains a science section, copy for which is produced by the Office of Research Information.

Translating Photocopy. Responding to a need repeatedly expressed by NIH scientists, SRB put into effect a system which would provide scientist users with permanent photocopies of translation manuscripts produced by the Translating Unit. The scientists complained that the loan copies were not satisfactory since they often had to refer to material long after it had been returned to the Translating Unit.

Transfer of RSTP. When Scott Adams transferred to the NSF March 1, 1959, the direction of the RSTP was given to Dr. C. K. Himmelsbach, Director Special Programs, DRG, and administration, personnel, and public relations activities were placed in SRB as an interim arrangement pending final decision on the locus of the program. At year's end, the program was being directed by Dr. C. K. Himmelsbach's replacement in DRG, Dr. Sam Herman and SRB was continuing its activities in the Program.

Personnel Actions. SRB promoted 38 employees during 1959. Of the promotions, 10 were in the Library, 7 in Translation, 7 in Medical Arts, 6 in Photographic Section, 3 in P&R, 2 in the RSTP, and 1 in Editorial and 2 in the Office of the Chief. Of the individuals promoted, 22 were in junior grades up to and including GS-6, and 16 from GS-7 up. One promotion to GS-13 was for the new Librarian and 6 to GS-11 resulted from Civil Service upgrading of the translating categories. Three of the employees of the Branch, all members of the Medical Arts Section, received awards, 2 for suggestions that saved money and one for superior performance.

Overtime. The Branch for the second consecutive year reduced its use of overtime. Overtime amounting to $3,696 was spent in comparison with $5,282 in 1958 and $7,317 in 1957. The reduction of overtime reflects improved management and scheduling of work by the sections

since workloads have increased rather than decreased. The overtime occurred during certain peak meeting periods such as those prior to the Federation meetings and for public events such as the scheduled visit of Premier Nikita Khruschev to NIH during his tour of the United States.

DRS Editorial Board. The SRB administered the editorial review and clearance program for the DRS Editorial Board. Twenty-five scientific papers were reviewed and cleared, the same number that were cleared in 1958. Six informal talks based on notes were made by Division personnel and the editorial board was notified. Twenty-two DRS press releases were written and cleared.

DRS Technical Writing Course. The SRB administered the DRS Technical Writing Course. Instructor was George DeGennaro, Department of the Army and former member of the faculty of George Washington University. Thirteen DRS employees who took the preliminary course in 1958 enrolled for the advanced course which emphasizes the preparation of technical papers for publication.

Roster for Information Personnel. The central roster on applicants for NIH information positions was continued by the SRB during 1959 as a service to ORI and the information officers of the Institutes and Divisions. In 1959, about 70 applicants were interviewed and three persons were placed from the roster into information positions.

Workload Reports. The Branch refined its workload reporting system so that all sections including the Library now uniformly provide the data needed.

Varityping Services Improved and Consolidated. The varityping services performed by the Medical Arts Section for the benefit of scientists needing tabular and caption material for slides were consolidated with the varityping services performed by the 3-man Copy Preparation Unit of the P&R Section.

Position Papers. A number of position papers were drafted by the Branch office. Among these were papers concerning a proposal to regroup certain SRB activities and redefine its functions, a suggested proposal for the location and administration of the RSTP, the need for a proposed manual on clearance procedures and acceptable typographical styles and format, and the role of motion pictures in NIH research.

Consultant Services. Chief, SRB, served as a member of three Ad Hoc Study Section panels for DRG on grant applications in the fields of scientific information retrieval and publishing.

Coordination of Services. The multiple-service coordination developed by SRB during 1958 received an unexpected test in 1959 when NIH was informed to expect a visit (which failed to develop as planned) by the Chairman of the Council of Ministers of USSR. The Branch was called upon to accomplish 41 projects which involved more than one service and all of which required service from more than one section in the Branch. These requests were made within four days of the expected visit. All projects were completed on time, including several in which all of the sections of the Branch participated. The coordination controls were maintained in the Office of the Chief SRB.

Transfer of DRS Press Relations Functions. All DRS public relations and information activities which were carried on by the P&R Section of SRB were transferred to the Office of the Chief, SRB in 1959. The move eliminated a communication gap and provided for direct control of the activities by the information officer of the Division. One of the writers of the P&R staff was detailed to the Office of the Chief to assist in carrying out these activities.

Training. The Branch conducted its Second Conference on Printing and Editorial Services. Attendance was limited to Branch personnel and sessions were devoted to explanations of editorial clearance policies.

During the year, several members of the Branch staff attended professional meetings or special training workshops. These were:

Vernon Taylor, Photographic Section, the Professional Photographers of America annual meeting and the Maryland Industrial Photographers annual meeting. Betty Mok, P&R, and Mary Henley, P&R, Workshop Seminar of the American Society of Technical Writers and Editors. Taft Feiman and Jean Torgerson, of Office of Chief, the Mid-Atlantic Conference of American Medical Writers Association. Phil Joram, Medical Arts, Third Annual Technical Forum of the Society of Plastic Engineers. Joe Plass, Photographic Section, Industrial Photographers Management Course sponsored by the Industrial Division of Professional Photographers of America.

Charlotte Kenton, Library, the Medical Library Association, annual meeting. Twenty-five members of the Library staff attended the Seventh Conference of the American Library Association held in Washington. Mrs. Marion Steinbarge, Library, Institute of Periodical Indexing Services at Columbia University School of Library Service, Henry J. Cole, Photographic Section, the Third Medical Motion Picture Workshop, Calvin Co., Kansas City, Mo. Mrs. Thelma Robinson, Library, Biological Sciences Group, Special Library Association. Dan Rice, P&R, PHS Information Officers Seminar, CDC. John Clopine, Librarian, American Documentation Institute, and Roy Perry, Photographic Section, CDC.

Information Activities. The Branch office provided major assistance in preparing several DRS publications or brochures, leaflets and information material. Among these were projects such as:

1. A new LAB animal hospital brochure for intramural use. 2. The DRS portion of the DHEW annual report. 3. The DRS research highlights. 4. Two chapters contributed by LAB and SEB for the second edition of Laboratory Design published by the National Research Council. 5. A Directory of Personnel Resources for DRS internal use. 6. Material for SEB for the second Symposium on Gnotobiotics Technology at the University of Notre Dame. 7. "Veterinary Notes" memorandum for Chief LAB. 8. The DRS portion of the NIH Brochure. 9. DRS participation in the Animal Care Panel meeting October 29-31. 10. Dr. Jane Uhrich, LAB Animal Hospital, interview for USIA broadcast. 11. Local press coverage on the option of the animal farm.

The Branch office also assisted on the following:

1. Editorial clearance at PHS-DHEW levels for the NIMH Psychopharmacology Service Center Bulletin. 2. Review and clearance of the first and subsequent issues of the Bulletin of Translations from Russian Medical Sciences. 3. Review of copy for the book, Disease Detectives, for its author, Harry Edward Neal, and arranging appointments with scientific staff. 4. The revision of the NIH Brochure. 5. Inventory of SRB information activities for the Management Appraisal Officer of OSG.

The Branch initiated publications for the following:

1. Bibliography entitled "Maternal Disorders Related to Fetal Stress, Perinatal Death and Congenital Defects", prepared by Mrs. Elizabeth Koenig of the Library staff. 2. Bibliography entitled "Medical Research in the Soviet Union", by Mrs. Koenig of Library staff. 3. The monograph on the USSR Academy of Sciences after clearance with State Department, CIA, DHEW, and PHS, for publication in Public Health Reports. 4. "Brucellosis in the USSR"—a review of Russian work in this field and published through SRB as part of the RSTP.

Review of Standards for Technical Writers. Chief SRB participated in the review of a tentative draft of new standards for proposed Civil Service categories of technical writers and editors.

LIBRARY SECTION A complete turnover in top administration of the Library was brought about by the departure of the Librarian and the Associate Librarian on March 1. The Chief, SRB, served as Acting Librarian until the arrival of the new Librarian on June 29. An Assistant Librarian was recruited and is scheduled to report December 21.

Study Proposed. The incoming Librarian, Mr. John Clopine, completed a survey of the library's backlogs. He proposed a study be made of the NIH Library and its operations. The proposal was supported by the Library Advisory Committee and has been forwarded. The Study will form the basis for a position paper on the relationship between the NIH Library and NLM.

A resume of the collection and dissemination of biomedical information by the NIH Library was prepared at the request of U. S. Senator Hubert H. Humphrey of Minnesota.

Security. Paneling was ordered and received to close off open space in the Reference and Processing Unit areas. After the paneling is installed, hours of service will be extended for better control of the collections.

Library forms were reviewed and revised during the year, and will provide increased operational efficiency.

Processing. Binding of library material on a program basis began in August. Current output is 165 volumes per month.

Review of the pamphlet collection resulted in withdrawal of 90% of the material. The remaining 10% went into the classified collection. The transfer of all state health reports and bulletins to HEW Library and NLM was completed during the summer. Withdrawn were 238 periodical titles and 60 titles added to the collection.

Seventeen hundred new guide cards were substituted for the original guide cards in the public catalog.

The Library added an estimated 30,960 serial issues and 3,205 monographs. Of the latter 2,231 were purchased, 288 came by gift and 103 were acquired by exchange. An estimated 716 volumes were bound during the year.

Concurrent with these acquisitions, the Library withdrew an estimated 33,289 pieces of material. This was only 876 fewer pieces than the number acquired during the year. There were 34,416 cards filed and 16,975 cards withdrawn.

Circulation Services. The Library's Circulation Unit loaned an estimated 65,403 pieces in 1959, a decrease of 1% over 1958. Estimated Interlibrary Loans were 5,317, an increase of 2% over 1958. The index of items borrowed from other libraries was 8.1%, compared with 7.9% in 1958 and 9.8% in 1957.

Total shelving, which includes loans, items used in the Library, and new items added, reached an estimated figure of 198,672. This is an increase of 1% over 1958.

Translating Unit. The Translating Unit made translations from the literature in 20 languages into English. It also made translations from English into five languages. An estimate of the Unit workload for 1959 is as follows:

Total pages typed translation	9,576
Total pages original text	5,844
Total hours in preparing translations . . .	12,540
Total hours oral translations	636

In addition, an estimated 3,000 translations were loaned to scientists.

An index of language ability of scientists at NIH was compiled by the Unit from a questionnaire circulated by Special Events Section, CC. A re-evaluation was made of the translation backlog and procedures instituted to reduce the backlog as much as possible.

The unit assisted in Clinical Center with interpreting when needed. Requests were for assistance in French, Spanish, Polish, and Latvian. The unit also assisted other PHS requestors when time permitted.

Reference Unit. Staff vacancies and turnover affected the overall efficiency of the Reference Unit. A comparison of estimated 1959 figures with 1958 figures is as follows:

	1959 (est.)	1958 (actual)
Biographical Information	1,706	1,742
Bibliographical Verification ...	2,692	2,557
Other Information	3,912	2,654
Selected References	250	262
Bibliographies Compiled	17	32
Intensive Literature Searches ..	90	47

There was an estimated 47.4% increase in category of "Other Information" and a 91.5% increase in "Intensive Literature Searches" completed as compared with 1958. The number of bibliographies compiled dropped 46.2%.

The Reference Unit produced bibliographies on a number of specialized subjects during the year. The Reference Unit personnel assumed primary responsibility for the selection and withdrawal of material.

A representative selection of 153 U. S. medical books was prepared for display at the American National Exhibition in Moscow.

MEDICAL ARTS SECTION

Production. The addition of two employees to the staff, enabled the Section to keep pace with an increasing demand for its services. This demand amounted to 1,730 requests requiring 29,822 man-hours. Of this workload volume,

the Drafting Unit completed 5,166 charts, graphs, maps, diagrammatic and technical illustrations. The General Illustrations Unit turned out 590 illustrations for slides, brochures, exhibits, cover designs, and poster-type displays. The Clinical Illustration Unit completed 323 medical-anatomical illustrations.

Plastic Unit prepared 200 mounts and the Moulage Unit constructed 7 models. Twenty-two new exhibits were produced by the section through design and construction phase. About 12 exhibits were revised and refurbished for display at scientific meetings.

Prefabricated Standby Exhibit. A scale model small exhibit (including shipping crate) which will be suitable for emergency use was designed by the Section. A pilot exhibit is scheduled to be constructed in the next year.

Special Illustration Projects. The section prepared for NIMH a series of illustrations on specific student situations. These illustrations were used in psychological tests of students entering college. Dr. George Coelho, Clinical Investigations, NIMH, used the illustrations and set up the themes for the artist.

Approximately 100 encephalographic illustrations are being produced for Dr. Giovanni Di Chiro, NINDB, for publication in an atlas on fine encephalography.

Sixty illustrations from sections of the human brain were complete for the Clinical Center Diagnostic X-Ray Department for publication in an atlas on laminography.

The hallucinations of a young epileptic patient were the subject of a series of drawings prepared for NINDB.

Plates for Bulletin 180. The Section completed updating of plates in the manual for "Microscopical Diagnosis of Malaria in Man", for Dr. G. Robert Coatney, NIAID. A new plate was made illustrating "Exo-erythrocytic stages of Plasmodium falciparum".

Plastic Research. New materials and techniques were tested in order to find suitable materials for various projects. A new plastic in steel-casting resin was used successfully in the production of heart-valve molds, eliminating intricate and costly machining of previous types of molds. A new practical and simple method for preparing hollow light-weight reinforced plastic models also was developed, and a paper describing this method is being prepared for publication.

The Section spent one year in searching for the best materials to use in preparing flexible models of the human heart requested by NHI.

A human heart specimen was used as a model. An agar mold was prepared and a wax master model was cast and from this model a multipiece plaster mold was constructed. The final models were cast in latex with a polyurethane plastic foam matrix.

Three-dimension transparent models were prepared by using a commercial technique known as "free blowing." This technique enabled the section to develop a clear plastic model of the lens of the eye entitled "The crystalline lens", for NINDB. Similarly, using the same technique, a small-scale model of a germ-free tank was made for NIDR.

Special Moulage Projects. The Moulage Unit prepared a large model of the human brain from which a light-weight vacuum-formed hollow model was then fabricated and used as the central motif for the NINDB exhibit on brain damage.

Assistance to White House Conference on Children. The Section assisted Douglas Hayes, Chief of Graphics Branch, DHEW, by preparing 70 illustrations for use in a publication by the 1960 White House Conference on Children.

Latex Training Model. A latex model of the human appendix and adjacent organs was prepared and fitted into a special box-like device to simulate the surgeon's eyeview during an appendectomy for use in training in surgical procedures. The project was completed for Dr. Max Koppel, Biometrics Branch, NCI.

PHOTOGRAPHIC SECTION Requests for photographic assistance to NIH Medical, Scientific, and Information staffs increased in 1959. In 1959 a total of 7,565 requests were filled in patient and clinical photography, motion pictures, photomicrography, gross pathology, and informational photography, an increase of 450 requests. Requests for chromatography and agar gel records increased.

The production figures for 1959:

Incoming Requests	B & W Negs.	B & W Prints	B & W Slides	Color Slides & Transp.	Multi-liths	Photo-stats
7,565	45,305	125,716	31,750	23,445	28,950	41,977

The Xerography-Multilith prints cost $3,800. These prints were made in lieu of regular black-and-white glossy prints by scientists preparing papers for publication. They would have cost approximately $5,300 as glossies. The multilith copies were used as duplicate copies for review purposes and are adequate for that purpose.

The Section expanded its duplicating services, providing 2 x 2 cardboard-mounted slides as a substitute for 3¼ x 4 glass-mounted slides. Needs of scientists making overseas trips, where weight of baggage is a consideration, had much to do with this change-over. In addition, the Section routinely processed 4 x 5 Ektachrome and Anscochrome film, as well as 35 mm. Anscochrome for approximately twenty researchers at NIH

Visual File. The system of print retrieval was improved. Metal shelving for storage of labeled items was obtained. Outstanding file prints with corresponding negative numbers were photographed on 35 mm. microfilm. The resultant strips were made into 8 x 10 composites, which permit simple handling and easy viewing of 30 individual prints on a single 8 x 10 sheet. This will benefit users of the Section's photographic files seeking needed prints.

Patient Photography. There were 962 requests processed. Among major projects were 16 calling for close cooperation with scientists in order to record patient progress over a period of months: Nine of these patients were from NCI, three from NINDB, three from NIAMD, and one from NHI. One long-term study with a cancer patient required frequent photographic observation for a period of three months, resulting in 100 color photographs showing reaction by various lesions of the arm and leg to ice applications. Other projects in this activity included:

Skin cancer research requiring detail studies of lesion sites in order to show responses to various forms of therapy.

Skin tests on the arm of one patient have been photographed since 1958, normally once a week, and under certain conditions two or three times a week.

Approximately 8,000 color shots were made of patient activities and approximately 13,000 black-and-white prints were supplied for record purposes.

Photomicrography and Gross Pathology. The photomicrography setup was used by 49 individual researchers. About 100 used various gross pathology services as well. Over 12,000 photomicrographs and more than 7,000 gross pathology prints were made. Outstanding users of photomicrographic assignments were research scientists working on high altitude studies in animals, polio virus studies of the spinal cord tissue of monkeys, arthritis studies in man and animal, microradiographs of blood studies, dietary deficiency studies in animals, industrial cancer studies in man and animal, experimental cancer studies in animal tissue culture and stained tissue, hair root radiation studies, and brain section studies.

Photography for Training Purposes. The Section's services to assist in providing visual material for internal training programs were used more frequently. There were 82 requests for photography of animal surgery, laboratory techniques, handling of equipment and specialized procedures devised by researchers. One project for Dr. Bruce Cohen, NINDB, called for detailed photography of a technique using needle injection into the blood vessel of a cat's eye. These were done in color to show details of physiological changes during the experiment. An assignment for the Clinical Center Pathology Department called for complete coverage of the Hematology Service, Clinical Chemistry Service, and Microbiology Service for use in a training program. Treatment techniques showing patient rehabilitation and manipulation of muscles required 200 photographs for use in a special publication on the subject. Other assignments involved

procedure or research on sterilizing equipment, irradiation of germ-free food, metabolic chambers, cancer radiation techniques, preparation of pharmaceuticals, construction of oral prostheses, and animal cage cleaning and preparing.

Information Photography. There were approximately 900 assignments for information program needs. Among these were; the Second Pan-American Conference on Rheumatic Diseases; the visit of the Health Minister of the USSR; the groundbreaking of the National Library of Medicine; High School Science Teachers Demonstration Conference; Report to the Nation on Cardiovascular Diseases; Cancer Chemotherapy Conference; and coverage of all demonstrations by NIH Fire Prevention Squad.

Lesser assignments included the Danny Thomas visit to NIH; coverage of the NIH cooperation with the National Zoological Gardens in developing a special prosthesis for one of the elephants; coverage of Instrumentation Exhibit; and general coverage of NIH Record needs.

The Section made 250 official portraits and 859 identification photos for commissioned officers.

Cinematography Records. The motion picture unit has documented progress of patient rehabilitation, portrayed heart surgery techniques, and recorded animal researches for NHI, NINDB and NCI.

Total motion picture footage in 1959 came to 18,700 feet of which 5,500 were in black-and-white, 13,200 in color. In addition, 2,600 feet of sound recordings were made, and 28,680 feet of film edited and prepared for presentation. Much of this editing was done for Dr. Leonard T. Kurland, NINDB, for his film, "Amyotrophic Lateral Sclerosis," and Dr. Carlton Gajdusek, NINDB, on his researches in Kuru fever. Assistance was also given to editing footage taken by the CC for its TV system.

A total of 19 requisitioners presented 76 requests for motion picture services. Among them are: Dr. Glenn Morrow, CC, Heart Surgery, for surgical techniques in mitral and pulmonic stenosis; Dr. Donald L. Fry, NHI, for high-speed motion picture records of blood pressure changes within plastic tubes; Dr. Harriet Maling, NHI, for research on pharmacological effects of certain drugs on the nervous system of dogs; Dr. Roderick Murray, DBS, for polio research; and Dr. Stanley Farro, NINDB, for induced Minimata disease in cats.

Four-fifths of the overtime in the Section originated with information assignments in evening hours.

EDITORIAL SECTION

Central Clearance. The Editorial Section continued its role as the central point for all scientific papers, abstracts, and speeches submitted for NIH clearance, and for all press releases, exhibits, and health information materials intended for publication or public display. All papers received careful review before approval for publication. A total of 86 papers were sent to the Office of Research Information for further review.

DRS, Scientific Reports Branch, cont'd:

The clearance process was facilitated when the Section instructed Institute secretaries responsible for transmitting scientific papers, as to identifying data needed. Satisfactory results were obtained and many man hours were saved by the Section.

Statistics were prepared by the Section for the Office of Administrative Management, showing numbers of scientific papers cleared during fiscal years 1956-1959, and for the NIDR Information Office, showing papers cleared during calendar years 1957-1958.

The Section completed a survey of the published programs of the annual meetings of various professional societies to determine the relative contributions of technical papers by NIH staff. The PHS Division of Hospitals, BMS, reproduced and distributed materials about technical report writing which it obtained from the Section. Briefings on the mechanics and operations of the NIH clearance and editorial apparatus were provided to representatives of several Government agencies. The Section provided editorial review of 129 pamphlets, brochures, health education leaflets and flyers.

Statistics:	Papers and Abstracts Approved	2151
	Press Releases Cleared	117
	Exhibits Cleared	16
	Publication Requisitions Processed to Printer	129

Preventive Editing. The Section continued to provide, on request of individual scientists, editorial review and analysis of scientific papers in draft stages. Preventive editing also was applicable for all press releases submitted for clearance.

As part of its editorial services, the Section in collaboration with Chief SRB, began work on a glossary of usage and jargon. This would be made available only on request to those seeking help in improving their writing.

Statistics:	Scientific Papers Edited	23
	Press Releases Edited	117
	Telephone Calls Asking for Editorial Assistance	102

Literature Reporting. This activity provided titles of published NIH articles and the published papers from grant-supported projects as they were retrieved by screening the literature. These reports have been distributed on request twice weekly to Scientific Directors, Laboratory Chiefs, Information Officers, and other interested individuals inside and outside NIH.

Statistics: Report on NIH Published Papers

Reports	72
Titles reported	1085

Report on Published Papers from
NIH Grant-Supported Projects

Reports	72
Titles	5639

NIH Bibliography. Since 1957, the Editorial Section has prepared an annual bibliography of the scientific and technical publications of NIH staff, and constitutesthe most complete listing of published NIH papers available. Retrieval of titles was accelerated this year by using the screening of literature as the basis for the document instead of waiting for the annual Analysis of Program Activities to be compiled.

Appearing for the first time in the bibliography was a directory of key scientific personnel prepared by the Personnel Management Branch under the direction of the Office of Research Information. Compilation of the directory delayed publication of the bibliography by two months. The directory reflects the organizational structure of NIH as of February 1959 and gives the names of key persons in the various programs, including all staff members with doctorate degrees. Completing the publication is an index of names, which lists alphabetically all the staff members included in the directory and the bibliography. A total of 10,000 copies of the directory and bibliography were printed and distributed to scientists and appropriate scientific and research groups in and outside NIH.

Collected Reprints and Archives. The Section continued to receive six reprints of every paper published by an NIH scientist. A card file was completed for all 1958 reprints, and one was maintained for 1959 reprints. The Section continued to maintain a central repository for all NIH scientific papers submitted for clearance. A card index for all papers provides a quick check on titles, time of clearance, and furnishes, when needed, bibliographic data for NIH staff. Editorial Section files provide the periodic listing in the NIH Record of scientific papers received for clearance.

Statistics:		
	No. of 1958 Reprints Indexed	760
	No. of 1959 Reprints Received and Logged	535

Correspondence and Inquiries. Editorial Section received 2446 letters and telephone inquiries from the general public, NIH, and other government departments. Inquiries covered the whole range of NIH activities and required routing to appropriate Information Offices of every Institute, to departments and individuals in DHEW.

PUBLICATIONS AND
REPORTS SECTION

Reports. The Section produced "Training and Educational Activities of the National Institutes of Health, Public Health Service," a report requested by the Library of Congress for publication by the House of Representatives Committee on Education and Labor as a part of the updating of House Document No. 423, 82nd Congress, 1951.

Special Purpose Publications. Revision of the NIH Brochure, titled The National Institutes of Health, which was begun in late 1957 as a mere updating project and continued in 1958 (subject to delays caused by organizational changes), was completed by the P&R Section after extensive revision of the format to include new display type, an improved quality of paper, the bleeding of illustrations, and a new cover design. ORI completed final revision and sent brochure to the printer.

The Section prepared a draft of Supply Services Guide, now undergoing final review by SMB prior to final editing for offset reproduction, and assembled text material to be used in preparing an NIH training recruitment brochure, which was turned over to the NIH Training Committee for discussion with the Chairman of the NIH Information Training Committee.

Periodicals. Beginning with the October 27th issue, the bi-weekly NIH Record, appeared in a new, expanded format, printed commercially by letterpress (instead of offset by DHEW) under terms of a contract awarded by GPO. Five issues of the new format were published before the end of the calendar year. The first four of these consisted of eight pages, including a four-page Science Section for which text and illustrations were prepared by ORI. A number of planned improvements and refinements remain to be made. Within this two-month period the Record printing has had to be increased from 4,800 to 5,600 reflecting an increase in reader interest.

The Section published 52 issues of the NIH Calendar of Events. During November the Section made contact with the many groups that supply material for this weekly flyer and persuaded them to designate one person to be responsible for transmitting information on time for each issue.

Special Writing Projects. The writing activity of the Section was mainly associated with publicity and audiovisual projects. This included a message of welcome drafted for use by the NIH Director, several news releases, a four-page film script, written material supplied to the USIA, to newspapers and feature syndicates, magazines, and other organizations and information media. The Section revised an article on NIH for the 1959 yearbook of the Bethesda-Chevy Chase Chamber of Commerce. The Section also wrote about 20 news releases for the D. C. daily and county weekly papers and for alumni and trade publications.

Public Information Projects. The Section carried out the public relations activity for the Ninth Annual Research Equipment Exhibit and Symposium held at NIH the week of September 28.

Audiovisual Services. During the year the Audiovisual Unit worked with the Metropolitan Sunday Photo Group (a syndicate) to produce a series of pictures, and story material on NIH programs for the Sunday magazine sections of 15 large city papers in this

country and 16 in Canada; cooperated with USIA on a number of projects including the writing and shooting of a film story on NIH for overseas use by 34 television stations; served as TV director for NIAMD in coordinating three projects shown on closed-circuit television in the CC auditorium to 200 visiting high school science teachers, narrated a film on nutrition studies in Ethiopia and a sound tape for use with an NINDB exhibit, and worked closely with the CC Information Officer, Potomac Film Producers, and the USDA Motion Picture Service in the shooting of scenes for the new NIH information film. The unit set up appointments, supplied pertinent information material, and served as host and guide to a New York Evening Post science writer who obtained material for a series of six full-page articles on research activities at NIH.

The Audiovisual Unit also added extensively to its NIH central photo and slide libraries, and from them distributed 1,094 prints and captions to newspapers, book publishers, and other information media, and loaned 475 slides for lecture use.

Public Inquiries. In response to public inquiries, the Section wrote 218 letters. Distribution of published material within and outside of NIH totaled an estimated 16,575 items.

Mailing Keys Revision. The Section, with DHEW Reproduction Branch, reviewed NIH Research Highlights and other addressograph mailing keys and arranged for maintenance and flexible use to meet a variety of information service distribution needs. Twice within the year the Section distributed to NIH Information Offices galley proofs of the revised keys, supplied by DHEW, listing science writers, public relations officers and others.

Photocopy Preparation. The staff of the Section's Photocopy Preparation Unit was increased, November 16, by the addition of a part-time member, Mrs. Donna Cuscaden, making it possible for the Section to take over from Medical Arts Section the preparation of tables for slides for scientists. Publications prepared for offset printing in 1959 included three issues of the Bulletin of the Russian Scientific Translating Program, five Reference Guides for NIMH, three NIH lecture programs and announcements, seven brochures, the NIH Annual Awards program, a Civil Service announcement, training course pamphlet, and five issues of Cancer Chemotherapy Reports amounting to 350 pages. In addition the Unit produced 163 tables for slides, 82 tables for publication, 83 forms, 39 formulae, 459 Headliner items, 50 captions, four programs, 10 covers, 40 charts for slides, 44 charts for publication, 16 graphs for slides, and 37 pages of miscellaneous material.

Binding. The Section arranged for binding 199 volumes of various publications, requested by the Office of the Director, NIH.

Problems

Many of the major problems of the Scientific Reports Branch, which either had their genesis prior to organization of the branch or were consequences and birth-pains of the new grouping, were solved during 1959.

During 1959, complaints were infrequent and commendation of Branch personnel by users of its services was not uncommon. The Division-Branch-Section interrelationships were marked by good communication, cooperation, and understanding of service objectives.

A significant administrative problem of long standing came to life in 1959. It involved the management of the Publications and Reports Section and the Editorial Section, both of which are closely associated with the Office of Research Information, in the course of accomplishing program objectives. The specific problem is that administrative relationships and lines of responsibility have not been clearly delineated and observed with the result that management of the activity is in effect divided. Considerable study was given to this problem during the year and proposals were developed for solving it.

New problems that are receiving attention are the following:

1. Full development of the central visual aids services for NIH. The present services offered by the audio-visual unit of the P&R Section are inadequate. They have not developed along the lines programmed by SRB which has planned a more complete and responsive service to the scientific and administrative staffs of NIH. Accordingly, SRB has proposed that the central visual aids function be assigned to the Photographic Section, which as a practical matter, already provides most of the material for this activity. Such organizational changes would also bring about a change in the nature of the service. It would assure equal responsiveness to all users of the services and would provide the technical and professional knowledge required to expand.

2. DRS public relations activities. The Chief of the P&R Section frequently cited his major production problem to be the assignment of certain DRS information material. Accordingly, this problem was resolved by transferring all DRS information activities to Office of the Chief. Chief SRB serves as Information Officer for the Division, and one writer from P&R Section was assigned to assist him in carrying out this function.

3. Retention of Competent Personnel. The Branch is experiencing difficulty in retaining competent personnel. Better offers, both in salary and in fringe benefits, are being made to Branch employees constantly by industry. Civil Service ratings, particularly at the Section Chief and Assistant Section Chief levels of the Branch have been unrealistic and cannot compete with these offers from competitors for these skills. As a result, during the latter part of the year the Branch is losing the services of one of its Assistant Section Chiefs who has a potential for leadership and career development, and is in danger of losing another individual with much the same potential.

4. Library Manpower and Security. The major problem facing the Library is a two-dimensional manpower problem. The present staff is thinly spread. Essential functions are halted whenever anyone performing them is absent. At the same time, the grade structure of the Library is such that it weakens its recruiting efforts and makes it difficult to retain competent professional personnel. The other problem of the Library concerns the security, or lack of it, of the collection. Steps toward remedying the inadequate controls of the past were initiated by SRB in 1959. The security problem will not be resolved however, until the partitioning separating the Library from the corridors is erected and manpower is supplied to service Library users during all open hours including evenings. When these are accomplished the excessive loss in material, and the deterioration of the Library service resulting from these losses, will come to an end.

5. Library Photo-Copy Service. One of the Library's long-time problems is for provision of a photo-copy system. In the latter part of the year, the new librarian suggested a resolution of this problem which would provide for rapid and effective copy service to scientists on NIH grounds without actual removal of original material from the Library.

6. Inflation. An oncoming problem is anticipated for the Library and also for Photographic Section and Medical Arts Sections as a result of increasing prices. Both the Photographic Section and the Library are feeling the impact now and the increase in prices for literature and for photographic equipment combined with expanded intramural research programs heralds the need for more funds for these activities.

7. Distribution. Lack of an adequate distribution system at NIH has affected some of the Branch's operations. One example, which indicates the need for development of a central distribution activity under professional management, is the hit and miss method of distributing the NIH Record. At the end of the year the NIH Record was still receiving complaints from NIH staff that some are not receiving copies at all and some complaints were being received from areas that too many copies were being delivered. Not only is the NIH Record affected by this inadequate distribution but so is the weekly Calendar of Events.

8. Space. The transfer of the Editorial and P&R Sections to Building T-19 provided adequate space but because of distance to the main users of their services difficulty of communication was encountered and proved to be a hardship. The lack of an effective mail delivery system particularly worked against these sections. Much of their correspondence and necessary official papers were frequently delayed because of the inability of the mails system to provide for adequate sorting and delivery. As a result, much of the mail has been left with NCI offices in the building with a subsequent loss of time in reaching its proper destination. Repeated efforts to resolve this situation have not been rewarding and at the end of the year there was still a problem in receiving the mail directly and speedily.

December 1959 Calendar Year 1959

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

DIVISION OF RESEARCH SERVICES

Summary of Branch Activities

1. DRS - 4
Serial Number

2. LABORATORY AIDS BRANCH
Branch

3. Dr. Preston Holden
Branch Chief

Objectives

To provide scientists at NIH with a variety of supportive research services which, although essential to individual research projects, are more efficiently and economically performed as a centralized operation. These include animal production, biomedical instrumentation, sterile glassware and media preparation, animal quarantine and surgical services and comparative (animal) pathology services.

Programs

The production of high quality laboratory animals for research.

The design, development and fabrication of electronic, glass and mechanical instrumentation, not available commercially, for use in medical and surgical research.

The washing, sterilizing and processing of NIH laboratory glassware.

The production of all types of bacteriological and tissue culture media required in volume by NIH scientists.

The provision of quarantine, holding, surgical and radiological services for larger research animals, i.e., dogs, cats, sheep, goats, horses, monkeys, cattle, swine, etc.

The provision of comparative pathology services for the control and/or eradication of diseases of laboratory animals.

Progress and Accomplishments

ANIMAL PRODUCTION In general, all objectives set for the Section at the beginning of 1959 have been met or exceeded. "Standard Operating Procedures," developed in 1958, were put into effect and a training program for Animal Production Section caretakers was instituted. Greater supervisory control has resulted in increased employee efficiency and better quality in animals.

Continuing research included the development and testing of caging materials, caging design, animal nutrition, and the use of insecticides and detergents.

Operations during this, the first full year under the Revolving Fund, have been satisfactory. It is felt, however, that a more equitable and realistic method of billing can and should be developed.

The Section is well pleased with the increased speed and efficiency which Plant Engineering Branch has exhibited since its reorganization earlier this year.

Working closely with the research areas, special matings have been developed, information regarding animal care and nutrition supplied, and the delivery of animals on a scheduled basis arranged by the Section.

The Section Chief was invited to serve as a member of the Technical Guidance Committee of the Institute of Laboratory Animal Resources of the National Research Council, was Chairman of the Finance Committee of the 1959 Animal Care Panel meetings, and lectured to students of the Animal Caretakers Training Course, USDA Graduate School, held at Georgetown University.

Animal production, as compared to 1957 and 1958, was as follows:

	1957	1958	1959
Mice	724,100	794,000	832,750
Rats	164,100	156,000	170,350
Guinea Pigs	32,700	27,200	27,500
Rabbits	10,500	10,800	11,850
Hamsters and other animals	17,600	23,700	31,650
Totals	949,000	1,011,700	1,074,100

Approximately $70,600 worth of used caging was salvaged and reissued during the year.

INSTRUMENT SECTION In May of this year Dr. Fred Alt, an Electrical Engineer with considerable experience in the fields of electronics and radiation joined the staff in the capacity of Chief, Instrument Section.

The Instrument Section is gaining more and more recognition as one of the world's leading centers of biomedical instrumentation. Scientists from Brazil, Canada, Ceylon, Czechoslovakia, England, East Germany, France, Indonesia, Sweden and West Germany have visited the facilities, requesting advice and information. Many more have written requesting reprints of publications describing instrumentation.

A trend towards the establishment of small, strategically located "satellite shops" appears to be growing. At the present time, four such shops provide the close cooperation between investigators and instrument section personnel required by particular research programs.

Another improvement is direct periodic communication to NIH research scientists by the Section. This memorandum informs the scientists of new instruments as they are developed and presents suggestions regarding their use in biomedical research.

The "Electronic Age" is showing its influence in instrumentation at NIH as it is in other areas of research. Whereas in 1958 less than one-third of all requests for instrument engineering concerned electronic instruments, more than one-half are now related to this field.

In the mechanical engineering field, one of the major goals is to simplify laboratory procedures and save operating costs through automation. Devices designed for such purposes range from a small multiple syringe drive to a 60 gallon automatic pipette washing machine. In the chemical field, a method of coating platinum electrodes for protection against polarization was successfully developed. Other important contributions were: an isotonic muscle fiber transducer, a portable air sampler for use in isolated areas such as field hospitals, etc., and a high-vacuum freeze drying apparatus for use with large samples which allows replacement of dessicants without loss of vacuum.

Well over 4,000 projects were completed during the year. Fabrication and repair of instruments totalled $376,000.

MEDIA AND GLASSWARE PREPARATION SECTION During 1959, Media Section and the Laboratory Glassware Preparation Section were combined under a single professional head, Dr. Alexander Kimler, well known in the fields of bacteriology and mycology.

The Glassware Processing Unit has continued to expand its services by processing just over 5,000,000 pieces of glassware. This represents an 11% increase in production and in the dollar value of glassware processed. A significantly larger increase took place in the total pieces repaired and in the dollar value thereof.

Statistically this may be represented by:

	1958	1959
Number of pieces processed	4,480,000	5,000,000
Value of pieces processed	$1,802,000	$2,045,000
Total pieces repaired	34,000	42,000
Value of pieces repaired	$16,000	$28,250

Temporary facilities are presently used for the sorting of soiled glassware. Permanent, custom-built tables and shelves will probably replace them in 1960.

The efficiency of the M-2, 60 foot, washing machine has been increased through the installation of automatic detergent level controls.

A second pipette washer has been equipped with the nylon carrier described in last year's report. It is hoped the third machine can be so equipped during 1960. These machines will, when fully equipped with the new carriers, have a capacity equivalent to five machines utilizing the older, obsolete type.

Installation of a second deionizer has doubled the volume of available final rinse water.

The use of the Clinical Center cage washing facilities has shown a slight decrease for the second continuous year. Just over 400,000 for 1959, this service is still very active and any decrease may be explained by the inertia shown in taking advantage of the facility.

Media production has apparently reached the point where factors other than need are being seriously considered by investigators before requisitions are placed. In spite of the fact that requisitions themselves increased by eight (8) per cent during 1959, tissue culture media issues have shown a modest decrease. This can be attributed to a growing cost-consciousness on the part of investigators who must pay for tissue culture media from their own project funds and, therefore, order only a minimum amount of media. In most other workload factors an increase over 1958 is evident, as shown below:

	1958	1959
No. of requisitions	7,400	8,000
No. of plates poured	80,900	97,300
No. of tubes filled	397,800	435,200
Available manhours	1,600	1,850
Volume prepared (in liters)	38,500	35,000

Noteworthy is the fact that although demand has been such that proper testing of each lot prior to release has been impossible, only a handful (less than 0.1%) of the media requisitions filled gave cause for rejection. Some testing is presently done and additional procedures are under consideration.

ANIMAL HOSPITAL SECTION A most heartening and perhaps reassuring note has been struck in the relationship between scientists in animal research and an increasing number of humane societies. In the past year 270 dogs, scheduled for wasteful execution, were donated to NIH in order that their lives might be of further service to humanity. Many years and much hard work has been devoted to the improvement of relations between these two groups of people and such concessions as have been made are worthy of recognition.

Anesthesia techniques developed by members of the Animal Hospital Staff permitted neurological surgeons to perform lengthy nerve graft operations on twelve goats. The operation was designed to test the ability of specially protected and treated nerve fibers to regenerate.

During 1959, the District of Columbia Academy of Veterinary Medicine was permitted to use the Animal Hospital facilities to hold two advanced courses; one in Veterinary Ophthalmology, the other in Clinical Pathology.

The installation of automatic watering and feeding devices in kennel areas, mentioned in last year's report, has been completed and is expected to produce a considerable saving in labor.

Seventy-two animals were donated to the Section during the year for use in medical research. The animals suffered from such conditions as hip dysplasia, osteogenic sarcoma, malignant lymphoma, bilateral juvenile cataract, epilepsy, and osteitis fibrosa.

The Chief of the Animal Hospital Section was requested to speak three times during the year on the use of tattooing as a means of identification of pets, three times on the surgical lengthening of long bones of the dog, and participated in the National Society for Medical Research Conference on the Legal Environment of Medical Research, and presented a scientific paper on the use of radiographic contrast media. Another staff member presented a lecture on feline disease problems.

Workload for the year, as compared to 1958, showed:

Conditioning and Quarantining

	1958	1959
Cats	2,200	2,350
Dogs	2,900	3,480
Primates	3,000	3,350

Surgery and X-ray

Operations performed	331
X-rays taken	683

Long-term holding

Average number of animals held	357

Since the activation of surgical facilities in the NCI wing of Bldg. 28, the number of operations performed by that institute in the Animal Hospital Surgery has declined from 131 in 1958 to 16 in 1959. This reduction in surgical workload has allowed the Animal Hospital Surgery group to assume many miscellaneous duties such as the providing of blood samples and special tissues and performing operative procedures as a service to other investigators. Although these activities have actually increased the workload of this unit, it is unfortunate that more use has not been made of the splendid surgical facilities available in Building 28.

The following items have been furnished by the Animal Hospital during calendar year 1959:

Blood:

Animal	Amount
Horse	63,000 cc
Sheep	62,400 "
Dog	2,000 "
Cat	200 "
Monkey	500 "
Goose	50 "
Poultry	200 "
Cattle	200 "
Swine	200 "

Eyes: 20

Tumors: (principally papillomas) 10

Parasites:

Tapeworms - NIAMD
Adult dirofilaria (living) - NIAID
(obtained by open heart surgery)

Some of the studies performed in the Animal Hospital facilities during 1959 were continuations of studies initiated during 1958. Others were initiated during the current year.

Continued studies were:

1. Complete removal of the pineal body of the dog.
2. Complete surgical hypophysectomy in dogs.
3. Surgical lengthening of long bones in the dog.
4. Continued studies in contrast radiography.

New studies performed were:

1. An abdominal window for viewing the viscera of a rabbit.
2. Therapeutic applications of partial penetrating keratoplasty in dogs.
3. Experimental production of vitreous detachment in dogs.

4. Incidence of Blessing-Iwanoff cystoid degeneration in dogs and cats.

GENETICS RESEARCH UNIT Many animal experiments are judged solely on the physiological response of the test animal to specific agents. To insure the reliability of the results of such tests, each animal must be capable of responding in a manner similar to that of all other animals of a like nature used in the experiment. Only through strict genetic control can such animals be produced. The major difficulty which arises in this regard is the need to constantly expand the numbers of animals available to the researcher while still maintaining stringent genetic control. The reorganization of the "production line" into a "foundation" colony, an "expansion" colony and a "production" colony, by Dr. Donald Bailey, Animal Geneticist, has permitted greater flexibility for maintaining colony size while concomitantly gaining greater genetic control.

Animal health control, as reflected in reproductive performance, is impossible to divorce from genetic control, for reproductive performance dictates what the population size shall be and how the pedigree shall grow, branch and generally subserve the goal of genetic control. Improving animal care should therefore be a never-ending assignment.

Improved animal care in the inbred mouse colonies is believed responsible for a gradual increase in production efficiency. The average litter size has climbed steadily from 5.11 in April to 5.86 in November. Also encouraging, and attributed to better care, is the absence of infantile diarrhea in the foundation colony. A seasonal disease,

infantile diarrhea is generally fatal to new-born mice, reaching epidemic proportions during the colder months. The incidence of chronic respiratory diseases in inbred rats has also been reduced through improved care.

A method by which genetic homogeneity may be determined, utilizing a rapid skin grafting technique, has been developed and will be used to spot check samples of inbred mice leaving the Animal Production Colony in the future.

COMPARATIVE PATHOLOGY SECTION The detection, identification and control or eradication of disease conditions in the Animal Production Colonies is one of the primary responsibilities of the Comparative Pathology Section. This requires constant vigilance on the part of the pathologists and the performance of large numbers of examinations. During the first 11 months of 1959, the following tests were performed:

Necropsies	10,410
Parasitology	923
Bacteriology	32
Histopathology	123

Necropsies were divided as follows:

Mice	6,530
Rats	2,260
Guinea pigs	910
Rabbits	550
Hamsters, and others	160

Such constant vigilance was responsible for the detection of an outbreak of coccidiosis in the rabbit colony late this year. Absent from the colony for many months, the disease, which attains epidemic proportions very quickly, could have gone undetected and unchallenged, were it not for the disease control methods employed. Methods designed to prevent the spread of the disease and effect its eventual eradication have been put into action.

Salmonella infection, common in most commercial mouse colonies, has not been found in the NIH colony for several years.

Pathologic conditions which were found, and for which control methods are being sought are:

Mice:

- Pneumonia
- Infantile diarrhea
- Genito-urinary infections
- Parasites (internal and external)

Rats:

- Chronic respiratory disease complex (rhinitis, bronchiectasis and middle ear infection)

Guinea pigs:

- Pregnancy toxemia
- Pneumonia
- Calcification disease

Rabbits:

- Snuffles
- Mucoid enteritis
- Coccidiosis

In addition to this important service to the Animal Production Section, Comparative Pathology was called upon 13 times during the year by NIH scientists to investigate disease outbreaks in their colonies; assisted scientists in other agencies, i.e., the Maryland Fish and Wildlife Service, Communicable Disease Center, etc., in problems involving the public health; and performed bacteriological examinations on monkey tissues as a part of the Monkey Disease Project sponsored by the National Advisory Committee on Primates.

Research carried out by the Section during the year resulted in:

1. Control and elimination of the chronic respiratory disease complex in experimental rats by the continuous administration of sulfamerazine in the rat feed for three generations;

2. Preliminary studies to determine the effect of sulfamerazine, oxytetracycline and tetracycline on the chronic respiratory disease complex when offered continuously in the drinking water for three generations;

3. Development of a "Chronic Respiratory Disease-Free" Holtzman-Fischer strain rat nucleus from parents fed sulfamerazine;

4. The initiatory development of a Sprague-Dawley strain rat nucleus which will be free of the CRD complex;

5. Development of "snuffles-free rabbits for snuffles studies; and

6. Development of a technique to uniformly infect snuffles-free rabbits with snuffles.

OFFICE OF THE CHIEF The staff of the Office of the Chief underwent several changes during the year, the most important of which was the transfer of Dr. Willard H. Eyestone to the NHI and the appointment of Dr. Preston Holden to the position of Chief, Laboratory Aids Branch.

During the year, staff members have actively engaged in planning the selection, procurement and operation of new large animal facilities to be located on a farm 25 miles from NIH in northwestern Montgomery County. The study of central service operations has also required close cooperation and participation of staff members with officials of other NIH groups.

Selection of well-qualified professional personnel to fill vacancies in key positions has thus far been successful with the appointment of Dr. Fred Alt as Chief, Instrument Section, Dr. Donald Bailey as Chief, Genetics Research Unit, Dr. Charles McPherson as Chief, Animal Production Section and Dr. Alexander Kimler as Chief of the newly combined Media and Glassware Preparation Section. Still to be filled are the positions of Assistant Branch Chief and Chief, Comparative Pathology.

Routine administrative and management functions of the Branch have continued to increase both in scope and in volume, reflecting the growth of the research program at NIH.

PROBLEMS

ANIMAL PRODUCTION SECTION — Lack of a satisfactory substitute vehicle for the delivery of animals prevents the release of the regular delivery vehicle for the time required by the motor pool to perform systematic inspection and preventive maintenance. Consequently, this vehicle receives a minimum of maintenance and is usually in need of some repairs.

The removal of refuse cans and the return of clean ones by the transportation unit has not been completely satisfactory. Further expansion by Animal Production will create an even greater problem in this regard.

INSTRUMENT SECTION — The greatest single problem with which the Instrument Section is faced is one of financing. Capable Engineers and Draftsmen can be found to fill needed positions much more easily than can funds with which to pay their salaries. It is unfortunate that the development of important new biomedical instrumentation must be delayed for almost a year (the average backlog is presently eleven months) before action can be taken. It is hoped that measures will be taken to rectify this problem within the coming year.

ANIMAL HOSPITAL SECTION Problems of a major nature are those attendant to the upkeep of present temporary facilities for large animals at the Rockville Farm. Anticipated procurement of permanent facilities for this function will materially reduce operational difficulties.

Future Objectives

ANIMAL PRODUCTION SECTION The demand for most species of animals is expected to continue to increase until such time as production facilities are capable of supplying all of the needs of the NIH.

The price of animals in the coming year will reflect the added cost of conversion of Laboratory Animal Caretakers from General Schedule to Wage Board salary tables. Unit costs are not expected to advance appreciably however, since the higher salaries will be spread over the entire year's production.

Future plans may have to include facilities for the sterilization of bedding materials. This procedure seems to be gaining more and more support as a preventive to the introduction of disease agents by this route.

INSTRUMENT SECTION The importance of instrumentation, particularly of electronic instrumentation, to biomedical research is steadily increasing. A recent questionnaire on the status of electronics in medical research, sent out by Senator Hubert H. Humphrey, Chairman of the International Health Study of the Subcommittee on Reorganization and International Organizations, bears witness to the interest which the nation has taken in this new field. To quote Senator Humphrey's memo of June 23, 1959, "It is the feeling of the subcommittee that, just as the science of electronics has revolutionized so much of the life of our own and other peoples, so, the application of electronics and mathematics to medicine offers some of the brightest opportunities for advancing human health."

The central instrumentation facilities of the National Institutes of Health will provide a logical center for concerted efforts to make the contributions of electronics engineers and scientists all over the country most beneficial to medical research. Thus, the Instrument Section will continue in the next year:

1. To serve as a center for information on developments of biomedical instruments;
2. To enlarge its central engineering facilities in order to cope with the ever increasing demand;
3. To create satellite groups of engineers and technicians to work in close contact with groups of investigators on program-connected instrumentation;
4. To work with the Biometrics Branch of NIH in making the outputs of biomedical instruments applicable to analysis by digital computers;
5. To encourage education in medical electronics by making the college student aware of the career opportunities in this field and of its benefits to mankind.

MEDIA AND GLASSWARE PREPARATION SECTION Renovations of space will provide additional laboratory and work areas to handle increased loads in both media and glassware preparation.

The organization will be modified as necessary to place it on a par with other groups providing a professional service. Research, such as is carried on at NIH, has long since passed the stage where its needs can be supplied with a "cook-book" and "kitchen" type of operation. An investigator must know, without question, that the materials he receives have been thoroughly tested

and will do exactly the job required. Present quality control procedures will be reviewed and supplemented by more stringent tests as may be indicated. The continued success of this program depends entirely upon the confidence of NIH scientists in the reliability of the products issued and the staff responsible for such products.

ANIMAL HOSPITAL SECTION Plans will be formulated during early 1960 for moving the large laboratory animals from the NIH Rockville Farm to the new NIH large animal holding facilities at Poolesville, Maryland. This move will be complicated because of the concurrent renovation necessary, and because some new construction for either dog or cat holding will be necessary. The move should be completed by August, 1960.

The conversion of Animal Caretaker employees to the Wage Board Schedule is expected to improve the quality of new employees recruited and to lengthen the tenure of present employees.

Smithy duties for our long-term large animals have been assumed by the Section and will be continued in the future unless a competent blacksmith can be found.

Although we expect the number of animals issued to remain essentially unchanged, we anticipate a greater demand for the long-term holding of large laboratory animals, particularly farm animals.

COMPARATIVE PATHOLOGY SECTION A considerable portion of the next calendar year will be devoted to the control, treatment and elimination of the more injurious diseases in the laboratory animals; to the development of an effective method for the control of infantile diarrhea in mice; to the control, treatment and elimination of snuffles in rabbits; to investigate the cause of mucoid enteritis in rabbits and pregnancy toxemia in guinea pigs; and to investigate the cause of urinary calculi and cystitis in some strains of mice.

OFFICE OF THE CHIEF Laboratory Aids Branch has problems similar to those of the other Central Services in anticipating the needs of the research areas. Programs undergo change, are initiated, or are terminated as current requirements dictate. The functions of Laboratory Aids Branch are so closely linked and so strongly influenced by research that the administrative staff must constantly be alert to changing trends in demand for services. A familiarity with the advances of research must be maintained with a view to the needs of scientists, not just for the present but for a year, and perhaps two years, in the future. As the volume and complexity of research at NIH grows, so also must the foresight of those responsible for the "tools" for research grow more keen and more discerning. So long as the Branch continues in its ability to provide these services, when and as required, to the scientific staff, our objective will have been reached.

(Attachment 1)

Serial No. DRS 4.1
1. Laboratory Aids Branch
2. Animal Production Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: THE DEVELOPMENT OF A SYSTEMATIC METHOD OF BREEDER ROTATION IN NON-INBRED ANIMAL COLONIES

Principal Investigator: Mr. Samuel M. Poiley

Other Investigators: None

Cooperating Units: None

Man-years (Calendar Year 1959):

Total:	.015
Professional:	.015
Other:	None

Project Description: Many attempts have been made in the past to duplicate the ability of wild animal populations to mate at will, in the laboratory. These have been unsuccessful for several reasons. In the first place, many of these traits have been associated with the identification of individual animals and have been abandoned primarily because of the enormously involved recording of data. Secondly, when the time for breeder replacement was at hand, suitable animals were not available. This project was, therefore, concerned with the development of a simple system that could be used by laymen as well as professionally trained animal breeders.

Part A. (Cont'd)

Its theory is based upon a formal system of selection in combination with the laws of chance. It has been instituted in the Animal Production Section Animal Colonies with marked success.

This system has been reported and has been accepted for publication.

Part B included Yes____ No_X__

(Attachment 1)

Serial No. DRS 4.2
1. Laboratory Aids Branch
2. Animal Production Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: RESEARCH IN ANIMAL HUSBANDRY PRACTICES AND PROCEDURES

Principal Investigator: Animal Production Section Staff

Other Investigators: None

Cooperating Units: None

Man-years (Calendar Year 1959):
Total: .6
Professional: .34
Other: .16

Project Description: Husbandry practices and procedures in the care and maintenance of laboratory animals are always subject to changes and revisions. Consequently, research studies on housing, feeding, cleaning, breeding, sanitary procedures, etc., are an integral part of any production colony activities. The present project is concerned with matters of this type.

During the past year, typical subjects of study have been as follows: the use of antibiotics and other drugs in the control of disease, optimal population numbers in cages, use of various bedding materials,

Part A. (Cont'd)

testing of guinea pig rations, testing of various dietary supplements, handling procedures for mothers and litters, comparisons of commercial animal caging, protective coatings for permeable materials, evaluations of commercial mouse production methods, the uses of various types of insecticides, and production methods in large animal colonies.

Some of these results are ready for publication and have been presented at the 1959 convention of the Animal Care Panel. The results of others have been quite interesting and these processes will be put into effect in certain of the production colonies in the near future.

Part B included Yes____ No X

(Attachment 1)

Serial No. DRS 4.3
1. Laboratory Aids Branch
2. Animal Production Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: HOUSING AND CAGING RESEARCH AND DEVELOPMENT

Principal Investigator: Mr. Samuel M. Poiley

Other Investigators: In collaboration with scientists from various Institutes

Cooperating Units: None

Man-years (Calendar Year 1959):

Total:	.06
Professional:	.06
Other:	None

Project Description: This project covers all aspects of research in the development and design of housing and caging equipment for laboratory animals.

During the past year these activities included studies of the durability of various types of plastic material, in addition to those cages made of metal.

Other facets of this program include the design of new equipment and the redesign of existing types.

Part A. (Cont'd)

New Items:

- Small monkey cage
- Food cup top
- Food cup disc
- Stand for mouse boxes
- Standard Rabbit Cage

Revisions of Cage Designs:

- Monkey observation cage
- Metabolic Unit for General Purpose Cage
- Suspended cage for metabolic studies
- Monkey Observation Cage Food Cup Holder

Salvage, revision, repair and reissuance of caging equipment to laboratories. An important phase of this operation in the past has been the remetalizing of galvanized equipment with a zinc coating. During the past year this activity was discontinued due to the relocation of the metalizing shop. Many usable items on hand cannot be reissued until they have been reconditioned.

Another phase of this project is the development of newer uses for standard items.

Part B included Yes____ No_X_

(Attachment 1)

Serial No. DRS 4.1
1. Laboratory Aids Branch
2. Animal Production Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: DEVELOPMENT OF NEW STRAINS AND THE INTRODUCTION OF NEW STRAINS OF COMMON LABORATORY ANIMALS, AND THE ADAPTATION OF NEW WILD SPECIES TO LABORATORY ANIMAL COLONY MANAGEMENT

Principal Investigator: Mr. Samuel M. Poiley

Other Investigators: None

Cooperating Units: All Institutes, Division of Biologics Standards

Man-years (Calendar Year 1959):
Total: 16
Professional: .04
Other: .14

Project Description: This project has been in progress for many years, and at the present time several groups are of prime interest.

Strain SSB/N-Rats: These animals are being bred for genetic resistance to respiratory infections that are commonly found in rat colonies. The successive backcrosses have been completed, and inbreeding is satisfactorily. Twelve families were originally isolated and of these one was discarded due to poor

performance, and another for failure to reproduce at satisfactory levels. Of the remainder, three lines look promising and the other seven will be discarded when the final evaluation has been completed. Inbreeding in all lines has been carried through the sixth generation.

JU/CN-Rats: The original breeders were obtained from Dr. Castle at the request of an investigator in the NIMH. Interest in these animals stems from their peculiar physiological makeup in that some of the animals carry hereditary jaundice. In addition, many of the homozygous jaundiced animals develop an involvement of the central nervous system. One group has been bred to Fischer rats for susceptibility to tumor transplants. Dr. Castle has cautioned us to refrain from inbreeding in order to avoid losing these genetic characteristics.

Mastomys coucha: A breeding start in these animals was obtained from the Army Medical Center at the request of the Laboratory of Pathology in the NCI. They are breeding quite well and all animals produced are being used by the NCI and the Laboratory of Tropical Diseases, NIAID.

Part B included Yes____ No_X_

(Attachment 1)

Serial No. [illegible]
1. Laboratory Aids Branch
2. Animal Production Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: TO DEVELOP A HYBRID COLONY OF MICE FOR USE IN THE SCREENING OF CHEMOTHERAPEUTIC COMPOUNDS, IN LIEU OF ONE THAT IS CURRENTLY IN SHORT SUPPLY

Principal Investigator: Mr. Samuel M. Poiley

Other Investigators: Dr. Abraham Goldin, NCI

Cooperating Units: None

Man-years (Calendar Year 1959):
Total: .014
Professional: .004
Other: .01

Project Description: F_1 hybrids of mouse strains BALB/cAnN females x DBA/2JN males, have been used for many years as the experimental animal for studies that are concerned with the effects of certain chemical compounds on the growth of tumor transplants. The strain DBA/2JN mice have a high incidence of cannibolism and are poor lactaters, and in addition breeding animals are always in short supply. It was, therefore, suggested that another combination should be mated in order to have available another source of supply for the required biological material.

Part A. (Cont'd)

Strain DBA/p (Poiley) has been maintained in the Animal Production Section Laboratories for many years, and there has been characteristics that are similar to those observed in strain DBA/2JN. This project is, therefore, concerned with the production of F_1 hybrids via matings of BALB/cAnN females and DBA/p males. Subsequent breeding performance has been excellent and several hundred animals have been transferred to Dr. Goldin's laboratory. The results of his investigations will be known in the early part of January, 1960.

Part B included Yes____ No X

(Attachment 1)

Serial No. DRS 4.6
1. Laboratory Aids Branch
2. Animal Production Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: ANIMAL CARETAKER TRAINING PROGRAM

Principal Investigator: Animal Production Section Staff

Other Investigators: Animal Hospital Section Staff

Cooperating Units: All Institutes, DRS, DBS

Man-years (Calendar Year 1959):

Total:	.25
Professional:	.25
Other:	None

Project Description: This project was begun in 1957 and has been continued at sporadic intervals since that time. Small groups of animal caretakers and medical biology technicians from DRS and Laboratories have participated in lecture and discussion groups.

More intensive training programs have been instituted in the Animal Production Section and the Animal Hospital Section. A handbook for Standard Operating Procedures has been developed and is being used in both Sections.

Part A. (Cont'd)

Transferees from these Sections to Institute Laboratories have satisfactorily demonstrated the results of this training.

Part B included Yes____ No__X__

(Attachment 1)

Serial No. DRS 4.7
1. Laboratory Aids Branch
2. Instrument Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: A LINE-OPERATED POWER SUPPLY FOR MOVABLE ANODE TRANSDUCER TUBE

Principal Investigator: George I. Johnston

Other Investigators: Gerald G. Vurek

Cooperating Units: Laboratory of Physical Biology, National Institute of Arthritis and Metabolic Diseases, NIH

Developed on Request of Dr. William J. Bowen, NIAMD

Man-years (Calendar Year 1959):
Total: .3
Professional: .2
Other: .1

Project Description:

Objective: Drift in circuits employing a standard RC5734 transducer tube frequently poses a difficult problem in strain measuring investigations. A drift-free power supply connected directly to line would eliminate this difficulty.

Part A. (Cont'd)

Method: The design aims at controlling both the plate and the filament supply voltages, since variations in these voltages are the main cause of drift in the D.C. amplifier. A bridge circuit connecting the tube and bridge resistors was designed in a manner to reflect a 20 volt variation in the bridge supply as an output variation of only two millivolts. A transistorized series voltage regulator circuit provides constant voltage to the filament.

Significance to Biomedical Research: The substantially drift-free power supply allows tensiometer readings independent of variations in the voltage output of any supply battery. It thus assures continued reliability of the instrument measurements. In its transistorized form it is of small physical size, allowing ready use in any laboratory with the usual 110 V convenience outlet.

Part B included: Yes X No ____

(Attachment 1)

Serial No. DRS 4.7
1. Laboratory Aids Branch

PHS-NIH
Individual Project Report
Calendar Year 1959

Part B.: Honors, Awards, and Publications

Publications:

G. I. Johnston and G. G. Vurek. A Line Operated Power Supply for Movable Anode Transducer Tube. Journal of Applied Physiology; Vol. 14, No. 3; May, 1959.

Honors and Awards relating to this project:

None

(Attachment 1)

Serial No. DRS 4.8
1. Laboratory Aids Branch
2. Instrument Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: AUTOMATIC MULTIPLE SYRINGE DRIVE

Principal Investigator: George F. Morris

Other Investigators: None

Cooperating Units: Clinical Pathology Department, Clinical Center, NIH

Developed on Request of Dr. Frederick Fox, CC

Man-years (Calendar Year 1959)
Total: .2
Professional: .1
Other: .1

Project Description:

Objective: The dispensing of small exact volumes of liquids into petri dishes by the usual method is time consuming. Automatic liquid dispensing by machine allows greater speed of operation and higher accuracy of the liquid volume.

Part A. (Cont'd)

Method: A syringe holder suppprts the desired number of syringes above a petri dish. A calibrated screw allows selection of liquid volume to be dispensed in fractions of a cubic centimeter. Equal volumes of the various solutions in the syringes are dispensed simultaneously into marked spaces of the petri dish. Syringes are filled, emptied, and cleaned without disassembly by means of a solution block; the entire assembled apparatus can be autoclaved.

Significance to Biomedical Research: This instrument is one of several designed by the Instrument Section, NIH, with the aim of saving laboratory operating time by means of automation:

Before instrument development:

Possible processes, by hand, per day	about 40

After installation of instrument:

Possible processes, automatic, per day	about 2400

The instrument, as is or with slight modifications, can be used for any process requiring the multiple dispensing, through syringes, of equal, adjustable amounts of liquids into containers.

Part B included: Yes X No ____

(Attachment 1)

Serial No. DRS 4.8
1. Laboratory Aids Branch

PHS-NIH
Individual Project Report
Calendar Year 1959

Part B.: Honors, Awards, and Publications

Publications:

C. H. Zierdt, F. A. Fox, and G. F. Norris. Multiple Syringe Bacteriaphage Applicator. American Journal of Clinical Pathology; February, 1960.

Honors and Awards relating to this project:

None

(Attachment 1)

Serial No. DRS 4.9
1. Laboratory Aids Branch
2. Instrument Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: A COATING FOR PLATINUM ELECTRODES TO PREVENT POLARIZATION

Principal Investigator: James J. Gilliam

Other Investigators: None

Cooperating Units: Surgery Branch, National Heart Institute, NIH

Developed at Request of Dr. Eugene Braunwald, NHI

Man-years (Calendar Year 1959)

Total:	.02
Professional:	.02
Other:	None

Project Description:

Objective: Polarization of electrodes presents a major difficulty where extended electrolytic tests are to be performed on body fluids. The particular case under study by the Surgery Branch, NHI, was the detection of hydrogen concentration in blood. It was desirable to find by experimental methods a coating which would prevent polarization on platinum electrode tips.

Part A. (Cont'd)

Method Employed: Platimum electrode tips, 5 mm X 1 mm, joined to stainless steel wire, were coated electrolytically with platinic chloride. Three variables are involved in such a process: concentration of the platinic chloride solution, magnitude of the electrolytic current, length of application time. By experimentally changing these variables a successful method for coating the electrode tips was empirically determined.

Significance to Biomedical Research: The coated electrodes have been used during the last few months for blood studies of about 45 minute duration each. No interruption of the test runs for electrode cleaning was necessary, no recoating between tests. The coating method thus makes possible uninterrupted electrolytic experiments of long duration.

Part B. included: Yes____ No X

(Attachment 1)

Serial No. IRS 4.10
1. Laboratory Aids Branch
2. Instrument Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: AUTOMATIC CONTROL OF OXYGENATOR VOLUME DURING CARDIOPULMONARY BYPASS

Principal Investigator: S. M. Meyers

Other Investigators: J. M. F. DeBroske, C. J. Byrne

Cooperating Units: Heart Surgery Branch, National Heart Institute, NIH

Developed at request of Dr. Andrew Glenn Morrow, NHI

Man-years (Calendar Year 1959)

Total:	.55
Professional:	.5
Other:	.05

Project Description:

Objective: This liquid-level sensing device is used with the NIH Heart pump during operations. In order to compensate for changes in extra-corporeal blood volume, a level-sensing device is needed which automatically adds or withdraws blood from an oxygenator while maintaining a synchronous arterial pump speed.

Part A. (Cont'd)

This was achieved by electrodes which detect the rise and fall of the blood level and which control a reversible pump through an electronic circuit. Incorporated into the circuit is a further safety device: if the blood level in the oxygenator falls below the level-sensing electrodes, the arterial pump automatically stops, preventing air injection into the patient.

Method: The system is operated either automatically, semi-automatically, or manually. The four level sensing electrodes are of platinum embedded in silicon rubber. One electrode provides the ground return for the other three. The second and fourth electrodes energize the pump as they get immersed, causing pump rotation in the proper direction. The third electrode stops the pump as soon as balanced conditions exist.

The voltage across the electrodes with respect to ground is 15 to 18 volts D.C., and the current is limited to 15 to 18 microamps.

A small time constant or delay is used on all tubes to eliminate hunting of the pump motor when the blood level becomes adjusted.

The level pump motor is a D.C. long shunt interpole type. Circuitry had to be designed to assure tolerance of instant reversal at full speed.

Significance to Biomedical research: The control and safety devices offered by this apparatus are needed for the safe application of a heart pump during heart operations.

Part B included: Yes X No ____

(Attachment 1)

Serial No. DRS 4.10
1. Laboratory Aids Branch

PHS-NIH
Individual Project Report
Calendar Year 1959

Part B.: Honors, Awards, and Publications

Publications:

J. A. Waldhausen, J. Ross, Jr., C. R. Lombardo, T. Cooper, J. W. Gilbert and A. G. Morrow. Flow and Volume Regulation During Cardiopulmonary Bypass: The Use of an Electromagnetic Flowmeter and a Device for Automatic Control of Oxygenator Volume. Proceedings of the Society for Artificial Internal Organs; Vol. 5, pp. 172-176; April, 1959.

Honors and Awards relating to this project:

None

(Attachment 1)

Serial No. DRS 4.11
1. Laboratory Aids Branch
2. Genetics Research Unit
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: DEVELOPING A RAPID SKIN GRAFTING TECHNIQUE

Principal Investigator: Dr. Donald W. Bailey

Other Investigator: Mr. Bashiruddin Usama

Cooperating Units: None

Man-years (Calendar Year 1959):
Total: .05
Professional: .03
Other: .02

Project Description: It has been well established that skin grafts will normally succeed only between individuals of like genetic constitution. In fact, it has been used in several instances to check the genetic constitutions of mammals, e.g., differentiating between fraternal and identical twins in cattle. Since this procedure has been found to be so sensitive, it has appealed to us as the ideal method to continually check the quality of mice leaving the Animal Production Section.

The usual skin grafting procedures are extremely laborious and time consuming, especially when used on a large scale as in a program of the type proposed here. Therefore, we have endeavored to develop a simplified technique which would reduce the time and number of steps required to a minimum.

Part A. (Cont'd)

The mouse tail has skin which obviously needs no clipping of hair. This was one step in usual techniques conveniently eliminated, therefore, we concentrated our efforts on developing a technique which involves exchanging tail-skin slices.

Various dressings (Adhesive plaster, thread, collodion, etc.) were systematically tried, various distasteful substances (picric acid, Thum) were applied to discourage gnawing of bandages. These attempts were of varying success. Gnawing of the bandages and subsequent loss of the fresh grafts was the greatest obstacle to success.

We eventually succeeded in preventing graft removal by slipping some glass tubing over the host tail and securing it with a wound clip. Concomitantly we noticed that no bandaging or other dressing was required.

The finally adopted technique has the advantages over current techniques in that it requires no dressing and it permits continual observation of the grafts through the glass tubing.

Part B included: Yes____ No X

(Attachment 1)

Serial No. DRS 4.12
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: COMPLETE REMOVAL OF THE PINEAL BODY OF THE DOG

Principal Investigator: Dr. James O. Davis, Head, Section on Experimental Cardiovascular Disease, NHI

Other Investigators: William I. Gay, D.V.M., Chief, Animal Hospital Section

Cooperating Units: Staff, Animal Surgery Unit, A.H.S.

Man-years (Calendar Year 1959):

Total:	.20
Professional:	.05
Other:	.15

Project Description:

Major Findings: To date no measurable physiological variation which could be attributed to absence of a pineal body has been found in these dogs. This will be reported once sufficient animals have been operated and followed.

Part B included: Yes ____ No X

(Attachment 1)

Serial No. DRS 4.13
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: COMPLETE SURGICAL HYPOPHYSECTOMY IN DOGS

Principal Investigator: William I. Gay, D.V.M., Chief Animal Hospital Section

Other Investigators: Dr. James O. Davis, NHI

Cooperating Units: Staff, Animal Surgery Unit, A.H.S.

Man-years (Calendar Year 1959):

Total:	.20
Professional:	.05
Other:	.15

Project Description:

Major Findings: Histological evaluation of the tissues in this study have not been completed, therefore, no report has been made. The Animal Hospital Section has completed its contribution to this project.

Part B included: Yes ____ No X

(Attachment 1)

Serial No. DRS 4.14
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: SURGICAL LENGTHENING OF LONG BONES IN THE DOG

Principal Investigator: William I. Gay, D.V.M., Chief, Animal Hospital Section

Other Investigators: None

Cooperating Units: Staff, Animal Surgery Unit, A.H.S.

Man-years (Calendar Year 1959):

Total:	.20
Professional:	.05
Other:	.15

Project Description:

Major Findings: This project has been continued using prosthetic devices made of stainless steel. The purpose of continuing the study is to evaluate materials proposed for use in filling bone defects.

This year pilot studies were carried out with "Skelly Bone" and a polyurethane polymer (bone glue). Both gave disappointing results.

Part A. (Cont'd)

On the recommendation of the originators of anorganic bone at the Naval Medical Research Institute, dogs which received anorganic bone grafts will be held another ten months before terminating that phase of the study.

Part B. included: Yes____ No_X_

(Attachment 1)

Serial No. DRS 4.15
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: CONTINUED STUDY IN CONTRAST RADIOGRAPHY

Principal Investigator: William I. Gay, D.V.M., Chief
Animal Hospital Section

Other Investigators: Dr. Sara Jane Ehrich, A.H.S.

Cooperating Units: Staff Animal Surgery Unit, A.H.S.

Man-years (Calendar Year 1959):

Total:	.20
Professional:	.05
Other:	.15

Project Description:

Objectives: In this study contrast radiography techniques are evaluated as a way of demonstrating experimental surgical results without sacrificing the experimental animals.

Course of Project: Attempts to outline the pancreas of the dog by any method other than cannulations of the pancreatic duct have been unsuccessful. Radiographs of the pancreatic duct system of the normal dog have been obtained.

Part A. (Cont'd)

Attempts to get air into the ventricles of the dog retrograde from the spinal cord have been promising, but not uniformily successful.

An exhibit of this work is maintained in the corridor of the Animal Hospital Building and it is always of interest to visiting scientists.

Part B included: Yes____ No X

(Attachment 1)

Serial No. DRS 4.16
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: AN ABDOMINAL WINDOW FOR VIEWING THE VISCERA OF A RABBIT

Principal Investigator: Sara Jane Uhrich, D.V.M.
Head, Experimental Surgery
Unit, Animal Hospital Section

Other Investigators: Dr. William I. Gay, Chief,
Animal Hospital Section

Dr. Jan Cammermeyer, NINDB

Cooperating Units: Staff, Animal Surgery Unit, A.H.S.

Man-years (Calendar Year 1959):
Total: .20
Professional: .10
Other: .10

Project Description:

Objectives: A lucite window for viewing the abdominal viscera of the rabbit has been designed by the above investigators. It is being installed and followed by Dr. Sara Jane Uhrich in cooperation with the Laboratory of Neuroanatomical Sciences, NINDB.

Part A. (Cont'd)

Course of Project: These devices have been kept in place in the rabbit abdominal wall for two-month periods. They have remained useful for viewing the abdominal viscera for one month. They do not appear to make the rabbit uncomfortable or endanger his health.

Future work with this device will attempt to keep it in place longer and to lengthen the time that it remains useful as a viewing device.

Part B included: Yes____ No _X_

(Attachment 1)

Serial No. DRS 4.17
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: THERAPEUTIC APPLICATIONS OF PARTIAL PENETRATING KERATOPLASTY IN DOGS

Principal Investigator: Lionel F. Rubin, V.M.D.,
Head, Dog and Cat Quarantine
Unit, Animal Hospital Section

Other Investigators: None

Cooperating Units: Staff, Animal Surgery Unit, A.H.S.

Man-years (Calendar Year 1959):
Total: .20
Professional: .10
Other: .10

Project Description:

Major Findings: Techniques are being worked out for corneal transplantation of dog eyes and the possibility of use of this technique therapeutically in dogs for conditions such as pigmentary keratitis, descemetocele, post-hepatitic corneal edema and pannus.

Part B included: Yes ____ No X

(Attachment 1)

Serial No. DRS 4.18
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: EXPERIMENTAL PRODUCTION OF VITREOUS DETACHMENT IN DOGS

Principal Investigator: Edward Okun, M.D.,
Ophthamology Branch, NINDB

Other Investigators: Lionel F. Rubin, V.M.D.
Animal Hospital Section

Cooperating Units: Ophthalmology Branch, NINDB

Man-years (Calendar Year 1959):

Total:	.20
Professional:	.10
Other:	.10

Project Description:

Objectives: 1. To determine incidence of retinal tears in old dogs.

2. To produce, through use of a photocoagulation device, artificial vitreous detachments.

Course of Project: The incidence of retinal tears is being determined using post-mortem specimens. Histological and fundic observations after photocoagulation are being made on selected cases.

Part B included: Yes____ No X

(Attachment 1)

Serial No. DRS 4.19
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: INCIDENCE OF BLESSIG-IWANOFF CYSTOID DEGENERATION IN DOGS AND CATS

Principal Investigator: Lionel F. Rubin, V.M.D.,
Head, Dog and Cat Quarantine,
Animal Hospital Section

Other Investigators: None

Cooperating Units: Staff, Dog and Cat Quarantine Unit, A.H.S.

Man-years (Calendar Year 1959):

Total:	.20
Professional:	.10
Other:	.10

Project Description:

Major Findings: The incidence of cystoid degeneration of the retina in the aging dog and cat is apparently more widespread than hitherto noted. Preliminary surveys indicate that the incidence approaches 80% in dogs approximately seven years and upward and that the cysts are more numerous than in humans.

Part B included: Yes ____ No X

(Attachment 1)

Serial No. DRS 4.20
1. Laboratory Aids Branch
2. Comparative Pathology Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: EXAMINATION AND OBSERVATION OF INDIAN RHESUS MONKEYS PRIOR TO AND DURING TRANSPORT FROM INDIA TO THE U.S.

Principal Investigator: Roy Kinard, D.V.M.

Other Investigators: John Richardson, D.V.M.,
Communicable Disease Center
Chamblee, Georgia

Cooperating Units: Parke, Davis & Co., Detroit, Michigan; Vita Private Ltd., Delhi, India; All-India Institute of Medical Sciences, New Delhi, India; Air India-International, New Delhi, India; Seaboard & Western Airlines, New York, New York.

Man-years (Calendar Year 1959):

Total:	.08
Professional:	.08
Other:	None

Project Description: This is the first phase of a study of the diseases of rhesus monkeys prior to, during and following transport. The study is sponsored and directed by the National Advisory Committee on Primates.

Objectives: 1. To collect and report data on environmental factors which may be responsible for illness of rhesus monkeys transported from India to the United States.

2. To collect specimens for serological, parasitological, virological and bacteriological examination in order to discover etiologic agents responsible for illness of rhesus monkeys transported from India to the U. S.

3. To perform autopsies on monkeys that died prior to and during transit from India to the U.S., and to collect tissue specimens for histopathology studies.

4. To deliver 600 monkeys to three laboratories in the U.S. for subsequent studies.

Methods Employed: 1. Six hundred and fifty-two rhesus monkeys were weighed, examined and identified by tattoo upon delivery to the farm of Vita Private, Ltd., Delhi, India.

2. Fecal swabs, for isolation of virus and bacteria, and serum specimens were taken from 110 of these monkeys. The serum specimens and the swabs for virus isolation were preserved and brought to laboratories in the U.S. The swabs for isolation of bacteria were plated out and preliminary steps of identification were taken. Selected cultures were brought to U.S. laboratories.

3. Twenty-two autopsies were performed. Specimens for viral and bacterial cultures, parasites, and tissues for histological examination were taken.

Part A. (Cont'd)

4. Daily inspections of the farm and the activities there were made. During the flight to the U.S., the monkeys and their attendants were under constant scrutiny.

5. Consultations with trappers, exporters, veterinarians and medical investigators of India were held in order to learn their ideas on the subjects of trapping, transport, and diseases of rhesus monkeys.

6. The survivors of the 652 monkeys were delivered to Parke-Davis & Company, Detroit, for distribution to the participating laboratories.

Major Findings: 1. The fact that such studies are practicable, under the conditions prevailing in India and in flight, was established.

2. Certain monkeys, apparently healthy, were found to be carriers of Shigella and Salmonella species at the time of delivery to the exporter.

3. Autopsies of 22 monkeys in India and in flight revealed the following lesions:

Lobar pneumonia	5	Cecocolitis	12
Peritonitis	1	Gastric polyp	5
Gastritis	9	Adrenal cortical hemorrhages	2
Enteritis	9	Urinary bladder hemorrhages	3

The numbers for gastritis and enteritis and urinary bladder hemorrhages are higher than have been observed in monkeys after delivery to the U.S.

4. Environmental factors, of which housing, sanitation and nutrition are of major importance, vary according to three phases of the chain of supply.

Part A. (Cont'd)

a. While in the care of the trappers the monkeys are usually kept in dirty cages and are ill-fed. It is likely that these conditions can be improved only with permission and aid of the Indian government.

b. Housing, sanitation and nutrition at the Vita farm are maintained at acceptable levels but could be improved.

c. Housing and sanitation are exceptionally poor in flight. The food is of acceptable quality. It is felt that immediate action should be taken to eliminate unsanitary conditions in transit.

Proposed Course of Project: Repetition in 1960.

Significance to Research Service: Any improvement, economic or humane, at any point in the chain of supply of monkeys will result in a reduction in expense of purchase and delivery of healthy monkeys to the U. S. and NIH.

Part B included: Yes ____ No X

(Attachment 1)
Serial No. DRS 4.21
1. Laboratory Aids Branch
2. Comparative Pathology Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: A STUDY OF GROSS AND HISTOPATHOLOGICAL CHARACTERISTICS OF DISEASES OF RHESUS MONKEYS BEFORE, DURING AND FOLLOWING TRANSPORT FROM INDIA TO U.S.A.

Principal Investigators: W. H. Eyestone, D.V.M.
Anton M. Allen, D.V.M.
Roy Kinard, D.V.M.

Other Investigators: None

Cooperating Units: Parke, Davis & Co., Detroit;
Christ Hospital Institute of Medical Research, Cincinnati;
Animal Hospital Section, NIH

Man-years (Calendar Year 1959):
Total: .56
Professional: .4
Other: .16

Project Description: This is a part of a study of the diseases of rhesus monkeys, sponsored and directed by the National Advisory Committee on Primates.

Objectives: To determine the presence of anatomical and histological lesions in rhesus monkeys which die before, during and following transport to U.S.; and to correlate these findings with the environmental factors and the results of the microbiological studies.

Part A. (Cont'd)

Methods Employed: 1. Six hundred fifty-two monkeys were purchased and identified in India and transported to the U.S. by air. The survivors of the journey were divided among three research institutions, one of which is NIH. Autopsies were performed on all the monkeys which died. Tissues taken at autopsy at the three institutions are being examined microscopically by the Comparative Pathology Section.

2. Concurrently, other investigators at the three institutions are attempting to isolate and identify viral, bacterial and parasitological agents and to evaluate the environmental factors which may lead to illness and death.

Major Findings: 1. Summary of the lesions observed at autopsies of monkeys of the NIH group:

Total Autopsies	63
Pulmonary consolidation	33
Pleurisy	6
Pericarditis	2
Tuberculosis	3
Gastritis	2
Gastric polyps (Noctia nocti)	6
Enteritis	11
Colitis and Cecocolitis	26

Single instances of many other lesions have occurred.

2. Bacteriological examinations have been carried out concurrently with the autopsies. The bacteriological findings will be reported by Dr. Charles McPherson.

Part A. (Cont'd)

Proposed Course of Project: The monkeys will remain under close observation and all that die up to December 31, 1959, will be submitted for autopsy. The microscopic studies will continue in 1960 until completed.

Significance to Research Service: Through increased knowledge of the etiology, pathogenesis and pathology of the diseases of rhesus monkeys before, during and following transport to U.S., losses of these monkeys can probably be reduced considerably. Such reduction in losses of monkeys will result in reduction of expense of purchase and delivery of healthy monkeys for NIH.

Part B included: Yes ____ No X

(Attachment 1)
Serial No. DRS 4.22
1. Laboratory Aids Branch
2. Comparative Pathology Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: A STUDY OF THE SPREAD OF TUBERCULOSIS FROM INFECTED MONKEYS TO THEIR CAGEMATES

Principal Investigator: Roy Kinard, D.V.M.

Other Investigators: None

Cooperating Unit: Animal Hospital Section

Man-years (Calendar Year 1959):

Total:	.16
Professional:	.08
Other:	.08

Project Description:

Objective: To determine if the standard practice of destroying the cagemates of tuberculin reactor rhesus monkeys is economical.

Method Employed: Each rhesus monkey that reacted to tuberculin while in quarantine at the Animal Hospital was submitted for autopsy. Tissues were taken for acid-fast staining and microscopic examination for tubercle bacilli. Each cagemate to a reactor

was placed under quarantine for a period of six months. Ordinarily monkeys are kept two in each cage; during the six months quarantine, the cagemates to reactors were kept one in each cage. The cages containing the cagemates were placed in an isolated room. Each cagemate was tuberculin tested every two weeks.

Major Findings: To date, sixty-three cagemates to tuberculin reactor monkeys have been placed under quarantine for six months. Of these, two have reacted to tuberculin and have been observed to have lesions of tuberculosis at autopsy. Of the remaining 61 monkeys, 25 remained under quarantine for six months without developing evidence of tuberculosis and have been released for laboratory use.

Proposed Course of Project: This project will be continued until December 31, 1960, or until 100 cagemate monkeys have been under quarantine for six months.

Significance to Research Service: The value of the cagemates to tuberculin reactor monkeys amounts to approximately $3,000 each year. All or part of this value may be saved as a result of this study.

Part B. included: Yes ____ No X

(Attachment 1)

Serial No. DRS 4.23

1. Laboratory Aids Branch
2. Comparative Pathology Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: A STUDY OF GROSS AND HISTOPATHOLOGICAL CHARACTERISTICS OF DISEASES OF LABORATORY, DOMESTIC, AND CAGED WILD ANIMALS WITH SURVEILLANCE OF THE CAUSES OF DEATHS OF SUCH ANIMALS QUARANTINED BY ANIMAL HOSPITAL SECTION

Principal Investigators: Roy Kinard, D.V.M.
Anton M. Allen, D.V.M.

Other Investigators: None

Cooperating Units: Animal Hospital Section

Man-years (Calendar Year 1959):
Total: 1.75
Professional: 1.
Other: .75

Project Description:

Objectives: 1. To be well-informed, through experience and experiment, of the characteristics of the diseases of laboratory, domestic, and wild animals.

2. To cooperate with other scientists of the NIH staff in the interpretation of related data.

3. To survey the causes of death of domestic and caged wild animals in the Animal Hospital Section and thereby assist in disease control procedures.

Methods Employed: 1. Perform autopsies and histopathology studies on animals of the quarantine colonies of the Animal Hospital Section. Cases of special interest submitted by investigators at NIH, the National Zoological Park or practicing veterinarians are also examined.

2. Consultations with scientists of the institutes are frequently held in order to derive maximum benefit from animal tissues made available for study.

Major Findings: 1. Summary of major lesions observed at autopsies of monkeys submitted by Animal Hospital Section:

Submitted for Autopsy			472
Examined			402
Discarded (Post mortem degeneration)			70
Intestinal Inflammation			
Enteritis			11
Colitis and Cecocolitis			203
Pneumonia			
Bronchopneumonia			48
Lobar pneumonia			10
Tuberculosis			
Tuberculin	Test	Autopsy	
	+	+	50
	-	+	5
	+	-	7
Peritonitis			13

Part A. (Cont'd)

2. Other lesions of interest which were observed during the year include the following:

Species	Source	Diagnosis
Cows (3)	Animal Hospital, NIH	Squamous cell carcinoma of eye.
Rhesus Monk.	Private owner	Osteogenic sarcoma.
Chimps (3)	Dr. Maitland Baldwin, NINDB	Tuberculosis.
Okapie	Nat'l Zool. Park	Tuberculosis.
Eland	Nat'l Zool. Park	Tuberculosis.
Hyrox	Nat'l Zool. Park	Severe tapeworm infestation of gall bladder and duodenum.
Dog	Animal Hospital, NIH	Mammary adenocarcinoma.
Dog	Vet. practitioner	Mammary adenocarcinoma.
Dog	Ambassador of Paraguay	Transmissable venereal tumor.
Dog	Vet. practitioner	Peritonitis due to severe tetratheridium infestation.
Rhesus Monks. (7)	Dr. Willie Smith, NCI	Generalized hemorrhages due to X-irradiation.
Deer	Dr. Carlton Herman U.S. Wildlife Svs.	Cutaneous fibromatosis.
Dog	Dr. Carlton Herman U.S. Wildlife Svs.	Mast cell tumors of skin.
Dog	Dr. Robert Farrier, CC	Hemangiopericytoma with metastasis.

3. Parasites identified during the year include the following:

		Parasite
Rhesus Monk.	Animal Hospital	Strongyloides spp.
Rhesus Monk.	Animal Hospital	Oesophagostomum spp.
Rhesus Monk.	Animal Hospital	Trichuris cyanocephalus
Squirrel Monk.	Animal Hospital	Prosthenorchis elegans
Squirrel Monk.	Dr. J.A. Gergen, NIMH	Oochoristica megastoma
Rhesus Monk.	Animal Hospital	Streptopharagus armatus
Emperor Boa	Nat'l Zool. Park	Styphlodora spp.
Rhesus Monk.	Animal Hospital	Anatrichosoma sp. (possibly a new species)

Part A. (Cont'd)

Proposed Course of Project: Continuation, with considerable emphasis being placed on development of project-type studies of certain aspects of animal diseases.

Significance to Research Services: 1. Pathologists well-informed on diseases of laboratory and wild animals are of value for consultation to scientists of the institutes.

2. Knowledge of the lesions of animals dying in the Animal Hospital Section improves the ability of the hospital clinicians to diagnose and control the diseases of the animals under their care.

Part B included: Yes____ No_X_

(Attachment 1)

Serial No. DRS 4.24
1. Laboratory Aids Branch
2. Comparative Pathology Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: A STUDY OF THE NATURALLY OCCURRING DISEASES OF LABORATORY ANIMALS

Principal Investigator: Dr. Robert T. Habermann, D.V.M.

Other Investigator: Dr. Charles W. McPherson

Technicians: Mr. Hezekiah J. Lewis
Mr. Willard Talley

Man-years (Calendar Year 1959):

Total:	3.0
Professional:	2.0
Other:	1.0

Project Description: Investigations are conducted to determine the incidence and cause of the naturally occurring diseases in laboratory animals,--mice, rats, guinea pigs, rabbits, hamsters, dogs, cats, and monkeys, and to develop methods for the control and treatment of these diseases.

Objectives: The objectives of the project are to develop healthy, vigorous, "disease-free" animals for research workers at the National Institutes of Health; conduct investigations

on bacterial, viral, mycotic, neoplastic, degenerative, and parasitic diseases to enable research workers to distinguish between the pathology produced by the naturally occurring diseases in NIH animals; to develop effective methods for the control or prevention of these diseases; and to develop techniques for the early recognition of an outbreak of disease in the animal colonies.

Methods Employed: 1. Various chemical substances are painted on the floor, cages, and racks in animal rooms to determine the efficacy of the chemicals to control vermin.

2. Various drugs are dusted on infected laboratory animals to determine the efficacy of the drugs to control external parasites.

3. Various drugs are mixed with ground animal feeds and drinking water to determine the efficacy of the drugs in the control of internal parasites.

4. Various drugs are mixed with ground animal feeds and water to determine the efficacy of the chemicals in the treatment and control of bacterial and viral diseases of laboratory animals.

5. Various methods of sanitation and of the care of laboratory animals are employed to determine the efficacy of these methods for controlling diseases.

6. Investigations are carried out to determine which specific bacteria, virus, or nutritional factors, or combinations of these causes, are responsible for pathology observed in some of the diseases of laboratory animals.

7. Daily necropsies, parasitic, bacteriologic, and histopathologic examinations are made of sick, dead, and aged animals from the production colony to determine the incidence of disease and to detect any new diseases, or spread of diseases, in the animal colonies.

8. Bacteriological examinations have been made on monkeys in the Monkey Disease Project sponsored by the National Advisory Committee on Primates.

Major Findings: The major findings of this project during the past year have been:

1. The control and elimination of the chronic respiratory disease complex (rhinitis, middle ear infection, and endemic pneumonia) in rats by the continuous administration of sulfamerazine in the rat feed for three generations.

2. Preliminary studies indicate that sulfamerazine, oxytetracycline (terramycin) and tetracycline (polyotic) may be effective in the control and elimination of the chronic respiratory disease complex in rats when offered continuously in the drinking water for three generations.

3. Development of a "Chronic Respiratory Disease-Free" Holtzman-Fischer strain rat nucleus from parents fed sulfamerazine.

4. The initiatory development of a Sprague-Dawley strain rat nucleus which will be free of Chronic Respiratory Disease.

5. Development of "snuffles-free" rabbits for snuffles studies, and

6. Development of a technique to uniformly infect snuffles-free rabbits with snuffles.

Part A. (Cont'd)

Proposed Course of Project: A considerable portion of the next calendar year will be devoted to the control, treatment, and elimination of the more injurious diseases in the laboratory animals; to the development of an effective method for the control of infant diarrhea in mice; to the control, treatment and elimination of snuffles in rabbits; to investigate the cause of mucoid enteritis in rabbits and "pregnancy disease" in guinea pigs, and to investigate the cause of urinary calculi and cystitis in some strains of mice.

Significance to Research Services: The development of healthier laboratory animals so that the results of experiments are more reliable; that less animals are needed to obtain dependable experimental results, and that the cost of conducting animal experiments is reduced.

Part B. included: Yes x No ______

(Attachment 1)

Serial No. DRS 4.24
1. Laboratory Aids Branch

PHS-NIH
Individual Project Report
Calendar Year 1959

Part B.: Honors, Awards, and Publications

Publications:

Robert W. Menges and Robert T. Habermann. Cultural and Serologic Studies on Four Dogs Inoculated with Two Leptospiral serotypes, Leptospira pomona and Leptospira canicola. Am. Journal of Veterinary Research. (In press).

Mildred M. Galton, Nell Hirschberg, Robert W. Menges, Martin P. Hines, and Robert T. Habermann. An Investigation of Possible Wild Animal Hosts of Leptospires in the Area of the "Fort Bragg Fever" Outbreaks. American Journal of Public Health, Vol. 49, No. 10, pp. 1343, October 1959.

Honors and Awards relating to this project:

None

(Attachment 1)

Serial No. DRS - 4.25
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: TATTOOING OF DOGS USED IN MEDICAL RESEARCH

Principal Investigator: William I. Gay, D.V.M., Chief, Animal Hospital Section

Other Investigators: None

Cooperating Units: Animal Hospital Staff

Man-years (Calendar Year 1959):

Total:	.02
Professional:	.02
Other:	none

Project Description: Numerous investigations have been made in regard to the identification of large animals used in medical research. Methods developed have included: plastic bands, tags on chains, ear clips, etc. These methods, however, have the common disadvantage of being detachable. Once the identifying band or tag is removed, identification ceases to exist.

The punch type of tattoo often becomes unidentifiable because of the spreading of the ink within the tissues, the formation of scar tissue, or infection of the tattoo wound.

Part A. (Cont'd)

The present method uses a recorded code symbol and is placed high on the interior surface of a hind leg. Since the tattooing is done with a regular tattoo needle, permanency of identification is assured.

This method of identification is mandatory in Canada and is recommended by the American Kennel Society for the registration of pedigreed animals.

Part B. included: Yes X No____

(Attachment 1)

Serial No. DRS - 4.25
1. Laboratory Aids Branch
2. Animal Hospital Section
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part B: Honors, Awards, and Publications

Publications:

Gay, William I., D.V.M., "Tattooing of Dogs Used in Medical Research." Proceedings of the Animal Care Panel, Volume 9, No. 2, June, 1959.

December 1959 Calendar year 1959

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

DIVISION OF RESEARCH SERVICES

Summary of Branch Activities

1. DRS 5
Serial Number

2. BIOMETRICS
Branch

3. Harold F. Dorn
Branch Chief

Objectives

The objectives of the Biometrics Branch are:

To provide expert biometric consultation concerning the design, execution, and analysis of experiments and studies.

To plan and conduct research investigations, usually in collaboration with other scientists.

To provide central statistical processing services by electrical accounting and statistical machines and by electronic data processing equipment.

Programs

The program of the Biometrics Branch is to carry out these objectives. Branch activities continue from year to year and are not readily classifiable into programs with a definite beginning and termination.

Accomplishments.

Consultation

The Branch engages in a great deal of consultation with experimenters, statisticians, and administrative personnel in the various Institutes and Divisions as well as with persons from outside the National Institutes of Health. Some of the more important projects during 1959 were :

DBS, Biometrics Branch, cont'd:

Advice to the Director, Department of Medicine and Surgery, Veterans Administration concerning the personnel and program of a newly created Division of Geographic Epidemiology.

Participation in an ad hoc study group of the National Research Council to consider the feasibility of establishing a register of professional and technical personnel exposed to ionizing radiation, for example X-ray technicians and roentgenologists, in order to conduct a long-term prospective study of the health hazards of low-level radiation.

Rocky Mountain Laboratory - In addition to consultation by mail, Mr. Lieberman spent several days at the Laboratory advising on the design of experiments and assisting in the analysis of experimental data.

Occupational Field Headquarters, Cincinnati, Ohio - with Mr. Howard L. Kusnetz: on project to evaluate Dragor tubes for detection of noxious gasses.

Dr. Anatole S. Dekaban, NINDB: continued consultation on studies involving pregnancy wastage and abnormal neurological findings in the total births for the year 1956 in Walter Reed and Naval Medical Hospitals.

Dr. Nathan B. Eddy, NIAMD: continued consultation on cooperative studies of analgesics in various laboratories in the U.S. and Europe.

Dr. Ernest Cutchins, DBS: on evaluation of the in vitro assay of potency of Salk Vaccine.

Lectures

Harold Dorn gave a lecture on the distribution and trend of mortality from cancer throughout the world at The School of Public Health, University of Pittsburgh.

Harold Dorn gave the Cutter Lecture on Preventive Medicine at the School of Public Health, Harvard University.

Conferences

Harold Dorn participated in the following conferences:

Epidemiologic Studies of Cerebral Palsy, Mental Retardation, and Other Neurological and Sensory Disorders of Childhood organised by the School of Public Health, Columbia University and held at West Point, N.Y. Jan. 19-21, 1959.

Radioepidemiology organized by the American Institute of Biological Sciences and held at the Argonne Laboratory, Feb. 2, 3, 1959.

Methodology in Epidemiological Studies of Cardiovascular Diseases sponsored by the American Heart Association and the National Heart Institute and held at Princeton University, April 24-26, 1959.

Epidemiology of Cancer of the Lung convened by the World Health Organization in Geneva, Switzerland, Nov. 16-21, 1959.

Participation in Activities of National and International Professional Organizations

Harold Dorn continued his activities as General Secretary of the International Union Against Cancer. During 1959 the International Union prepared a report on suggested projects for consideration by the World Health Organization in planning its program of support for Cancer research. Harold Dorn continued his participation in the activities of national organizations as a member of the Statistics Committee and Research Advisory Council of the American Cancer Society, director of the Population Reference Bureau, member of the Board of Directors, Executive Committee and Committee on Preventive Medicine and Social Science of the Social Science Research Council, member of the Committee on Occupational Cancer of the American Medical Association, and a member of the U.S. National Committee on Vital and Health Statistics. He also was appointed Chairman of the U.S. Committee for the Eighth Revision of the International Statistical Classification of Diseases, Injuries, and Courses of Death.

Interagency Committee on Medical Records

The Committee of which Harold Dorn is Chairman acted on several matters referred to it by the Bureau of the Budget. It also prepared a revision of several standard clinical record forms used in Federal hospitals.

Statistical Processing Activities

During the year, seven major administrative activities were transferred to the computer. These activities included: Revolving Fund, NIH Shop Stores Inventory, Records and Reports, and Research Grants and Awards. These reports, in combination with the accounts, payroll, and all other administrative activities, represent 44% of the regular one shift time. During the year, the 650 Computer has been in use on the average of 151 hours per month, of which 65 hours were devoted to research and 86 hours to administrative problems.

Recruitment of mathematicians, card punch operators, and tabulating equipment operators have been the major problems confronting this activity during the year. The overall recruiting effort, by the section, has resulted in obtaining thirty-four new individuals to-date. The breakdown is as follows: Six Mathematicians, one Tabulation Project Planner, twelve Tabulation Machine Operators, ten Card Punch Operators, one Statistical Coding Clerk, and four additions to our staff in the administrative and clerical line. Separations from the section during the year totaled eight, resulting in a net increase of twenty-two individuals, or an overall staff increase of approximately sixty per cent.

Our training efforts have continued throughout the year and have resulted in thirty-three of our employees attending various computer programming and equipment operation courses sponsored by the International Business Machines Corporation.

During 1959, the following new equipment has been added:

Three 024 Alphabetical Punches
Three 083 Sorters
Two 056 Verifiers
One 407 Accounting Machine
One 514 Reproducing Punch
One 063 Card Cont. Tape Punch
One 026 Alphabetical Printing Punch
One 089 Alphabetic Collator
One 101 Statistical Machine

During the year, the following equipment was discontinued:

Two 082 Sorters
One 075 Sorter
One 552 Interpreter
One 521 Punching Unit
One 604 Electronic Calculator

Major Problems

Space and the recruitment of professional mathematicians are our primary problems. Major recruitment efforts, through the Personnel Management Branch, have not as yet provided sufficient candidates to meet our present needs. The section has scheduled recruitment tours to the American University, University of Maryland, and Georgetown University. Vacancy notices will be sent to a large number of universities in the near future and recruitment tours scheduled, if sufficient interest is aroused. The availability of adequate work space has presented minor operating difficulties throughout the year but has now become a pressing matter due to the growth of our staff.

Reorganization of Biometrics Branch

The rapidly increasing demand for computation and data processing services at the NIH necessitated a review of the existing organization for providing these services. During 1959 several important changes were made in the organization and method of operation of the Statistical Processing Section. Dr. Norman Shapiro was employed to take charge of the development and operation of computational and data processing equipment and services at the National Institutes of Health. In order to relate more closely planning for such services to the projected demand, the Statistical Processing Section was placed on a fee-for-service basis beginning 1 July 1959. A review of the past growth and projected future requirements for automatic data processing services and of the potential applications of high-speed digital computers in medical research led to the conclusion that the development and provision of facilities to meet the projected needs would become a major activity. Accordingly plans were prepared to establish a Computation and Data Processing Branch to supersede the existing Statistical Processing Section. Simultaneously plans were made to establish a Biometrics Research Center in the National Heart Institute and to transfer the remainder of the Biometrics Branch to it.

Form No. ORP - 2

(Attachment 1)

Serial No. 5.1
1. Biometrics Branch
2.
3. Bethesda

PHS - NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title : CANCER OF THE UTERUS IN JEWISH AND NON- JEWISH FEMALES

Principal Investigator: Lucia Dunham, NCI; Harold F. Dorn, Chief, Biometrics Branch; Harold L. Stewart, NCI.

Other Investigators: None

Cooperating Units: Laboratory of Pathology, National Cancer Institute.

Man Years (calendar year 1959) :

Total : 0.1
Professional : 0.1
Other : 0.0

Project Description :

Objectives: (1) To determine the incidence of cancer of the cervix and corpus in Jewish and non-Jewish women; (2) To investigate factors that may be associated with any observed differences in incidence.

Method Employed The study was carried on in New York City and Israel. In New York City newly diagnosed cases of cancer of the uterus were reported to the study headquarters. In addition, an independent search was made in the records of hospitals for all cases diagnosed during calendar year 1952. Trained social workers interviewed the reported cancer cases and an equal number of control cases without cancer. The same

Part B included Yes _____ No. x

procedure was followed in Israel except that, in addition, cases of cancer of the breast and ovary were reported and interviewed.

Major Findings: The incidence rates for cancer of the cervix among Jewish females are about one-fourth of those among non-Jewish females in New York City. The incidence rates are the same for Jewish females in New York City and in Israel. In contrast, the incidence of corpus cancer is essentially the same for Jewish and non-Jewish females. Within the Jewish population in Israel the incidence of cancer of the breast, corpus, and ovary is higher for Ashkenazic than for non-Ashkenazic Jews, but no difference was observed for the incidence of cancer of the cervix.

Course of Project : Work was completed on the preliminary draft of a monograph.

(Attachment 1)

Serial No. 5.2
1. Biometrics Branch
2.
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: CANCER OF THE UTERUS IN NEGRO FEMALES

Principal Investigator: Lucia Dunham, NCI; Harold F. Dorn, Chief, Biometrics Branch; Harold L. Stewart, NCI

Other Investigators: None

Cooperating Units: Laboratory of Pathology, National Cancer Institute

Man Years (calendar year 1959):
Total: 0.1
Professional: 0.1
Other: 0.0

Project Description:

Objectives: (1) To determine the incidence of cancer of the cervix and corpus in Negro females; (2) to investigate factors that may be associated with the development of these forms of cancer.

Methods Employed: All newly diagnosed cases in New York City and Washington, D. C. are interviewed by trained social workers.

Course of Project: The interviewing of patients has been completed in New York City but is still continuing in Washington. The interviewing will continue until a sufficient number of cases for analysis has been interviewed.

Part B included Yes ____ No X

(Attachment 1)
Serial No. 5.3
1. Biometrics Branch
2.
3. Bethesda

PHS - NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title : RELATIONSHIP OF THE USE OF TOBACCO TO HEALTH

Principal Investigator : Harold F. Dorn, Chief, Biometrics Branch

Other Investigators: R. F. Kaiser, Katherine M. Herrold

Cooperating Units: Field Investigations and Demonstrations Branch, NCI
Laboratory of Pathology, NCI

Man Years (calendar year 1959) :
Total : 7.0
Professional : 0.1
Other : 6.9

Project Description:

Objectives: To determine differences in mortality from specific causes of death among persons with varying habits with respect to the use of tobacco; to investigate factors other than tobacco-for example, occupation and residence-which may also account for the observed differences in mortality.

Methods Employed: Information concerning residence, occupation, and the use of tobacco is being collected from about 290,000 persons who held U. S. Government Life Insurance policies in December 1953. As each person included in the study terminates a policy, the Biometrics Branch is notified by the Veterans Administration. If the policy is terminated as a result of death, information is collected from physicians and hospitals concerning the causes of death and the methods of establishing these diagnoses.

Part B included Yes x No ____

DRS, Biometrics Branch, cont'd :

Major Findings: The death rate from all causes of persons who have used tobacco is 32 percent greater than that for persons who have never smoked. Persons who have regularly smoked only cigarettes have a death rate 58 percent greater than the rate for nonsmokers. The excess mortality for cigarette smokers is greater for heavy than for light smokers. The mortality rate for regular cigarette-only smokers is 10 times that for nonsmokers.

Course of Project: A review and study of the histological diagnoses of cancer of the lung was begun in collaboration with the Laboratory of Pathology, NCI. Collection of medical information concerning the cause of death of deceased policyholders is continuing.

(Attachment 1)

Serial No. 5.3
1. Biometrics Branch
2.
3. Bethesda

PHS-NIH
Individual Project Report
Calendar Year 1959

Part B.: Honors, Awards, and Publications

Publications

Dorn, Harold F. and Cutler, Sidney J., "Morbidity from Cancer in the United States," Public Health Monograph No. 56, U.S. Government Printing Office, 1959.

Dorn, Harold F., "Mortality", Chapter 19 of The Study of Population by Philip M. Hauser and Otis Dudley Duncan, the University of Chicago Press, 1959.

Dorn, Harold F., "Tobacco Consumption and Mortality from Cancer and Other Diseases," Public Health Reports 74, 581-593, 1959.

Dorn, Harold F., "The Mortality of Smokers and Nonsmokers", pp. 34-57, 1958, Social Statistics Section Proceedings of the American Statistical Association, 1959.

Dorn, Harold F., "Some Problems Arising in Prospective and Retrospective Studies of the Etiology of Disease." New Eng. J. of Med. 261, 571-579, 1959.

Baer, Paul N., and Lieberman, Jacob E., "Observations on Some Genetic Characteristics of the Paridontum in Three Strains of Inbred Mice," Oral Surgery Oral Medicine, and Oral Pathology 12, 820-829, 1959.

Honors and Awards

Harold F. Dorn

(1) Re-elected as member of the Board of Directors and member of the Executive Committee of the Social Science Research Council.

(2) Elected to the office of Director, American Statistical Association.

(3) Appointed Cutter Lecturer on Preventive Medicine, Harvard University.

(4) Appointed Chairman, U. S. Committee for the Eighth Revision of the International Statistical Classification of Diseases, Injuries, and Causes of Death.

Calendar Year 1959

Summary of Branch Activities

1. DRS-6
Serial Number

2. SANITARY ENGINEERING BRANCH
Branch

3. Donald L. Snow, San. Engr. Dir.
Branch Chief

Objectives

The objectives of the Sanitary Engineering Branch are to perform the necessary surveillance, studies, and services to maintain, improve and develop those environmental conditions at the NIH which are both conducive to the health of its patients and employees and the maintenance of quality in research.

Programs

Environmental Health

Maintains continuous sanitary surveillance of facilities and services relating to patient and employee health, including: water supply, patients' and employees' food services and concessions, waste handling and disposal, and plant housekeeping and maintenance.

Surveys and conducts studies in associated environmental areas, including: hospital and laboratory infection hazards, sound and vibration control, dust, fume, and odor control.

Reviews plans for new construction and alterations, and identifies and recommends corrections to environmental defects in existing buildings.

Insect and Rodent Control

Assesses the prevalence of insects and rodents and the extent to which reductions can be secured through improvements in the general level of sanitation. Conducts insecticidal, rodenticidal and trapping activities to supplement the basic sanitation program.

Equipment Testing and Quality Control

Studies and recommends measures for improving the quality of various products of central services, including distilled, deionized, and other process waters and steam.

Evaluates and improves materials and equipment employed in cleaning processes for laboratory glassware, animal maintenance, and general plant sanitation; tests new sterilization equipment and methods.

Investigates corrosion problems in plant processes and laboratory equipment.

Germfree Services

Designs, develops, and tests new germfree apparatus and accompanying sterilizing and sterile techniques, and plans germfree facilities.

Provides engineering, bacteriological control and specialized equipment maintenance services for germfree investigations.

Investigates and develops methods and equipment for controlling and/or containing microbiological contamination associated with laboratory or patient care functions.

Progress and Accomplishments

ENVIRONMENTAL HEALTH SECTION Various activities centering on the NIH water supply received Branch assistance throughout the year. Nearly 300 tap water samples were collected and tested for total bacteria counts and the presence of coliforms. One area of the NIH distribution system received special chlorination as a result of this surveillance. The Section advised NIH building contractors on pipe chlorination procedures for four extensions to the water distribution system. A study on water pressure variations on the reservation during peak demand periods was conducted to supplement the water supply report of the DRS special consultant.

Inspections of employee food services and patient feeding facilities, with one exception, indicated a uniformly favorable level of sanitation. During the last quarter of the year the relocation of the Building 13 Snack Bar eliminated one of the most difficult problems among the employee food service facilities. Over 40 food service inspections were conducted and a total of 261 samples from the patients' formula and tube feeding preparation kitchens were examined. Sampling results among the latter were

uniformly satisfactory as opposed to those obtained the year previous.

Several odor-associated ventilation problems were referred to the Section. Among those handled was a request to develop engineering design criteria for the ventilation of animal rooms in Building 5. Results of the study will be used in developing more general standards for animal room ventilation.

A proposal for a wind tunnel study of the Clinical Center exhaust and intake air short-circuiting phenomena was secured following conferences with the New York University College of Engineering Research Division, and steps were being taken late in the year to consummate a contract for the study.

The Section was especially active on patient care sanitation problems and several projects relating to measures designed to minimize hospital infections were handled. A study was continued of the efficiency of various filters applied to portable vacuum cleaners for patient care areas (See Project Report). Based on recommendations offered by the Section, one manufacturer of vacuum cleaners has made special efforts to design equipment specifically for use in hospitals. Limited work was conducted on air-borne micrococci in patient care areas (See Project Report). Evaluations of Beta propiolactone as a laboratory area sterilant were started. Results have confirmed earlier Fort Detrick studies, but continued use of the material, other than in areas presenting frank infectious hazards, may be restricted because of its reported carcinogenic properties (See Project Report).

Bacteriological and other technical assistance, including training, given the Clinical Center Housekeeping Section, has been responsible in large measure for the present standardization and simplification of floor maintenance practices in Clinical Center patient care areas. Studies are now being programmed for evaluating the usefulness of detergent-sanitizers in hospital floor maintenance (See Research Report).

Assistance was given the CC Surgical Administrative Committee in developing minimum standards for practices for maintaining aseptic conditions in operating rooms.

A regular screening of all major and minor PEB design projects and a review of those having health and sanitation significance are now in operation. As the review process proceeds, standards will be prepared for those most frequently occurring design problems having health and sanitation implications.

INSECT AND RODENT CONTROL SECTION

A sanitary survey report of Building 3 was prepared in cooperation with the Environmental Health Section. Resulting from this report, NHI has indicated its intention to establish one additional position for special sanitation services in Building 3.

Combinations of new and more effective insecticides for roaches were tried during the year. Complaints received of objectionable odors from these materials resulted in diverting a substantial portion of the Section's insecticidal operations to the night shift. The increased supervision required for a double shift operation and need for more surveillance resulted in adding a second entomologist to the Section's staff.

The low figure of 49 rodent complaints during the year is especially satisfying and it is believed can be attributed to the care being exercised by NIH animal room attendants, combined with the effectiveness of our warfarin baiting program in all other buildings than the Clinical Center, and our trapping activities in the Clinical Center. Evidence pointing to a lowered escaped rodent population is shown in the following table.

Year	Mice Caught	Trap-Nights	Mice Caught per 100 Trap-Nights
1955	732	38,054	1.92
1956	580	33,400	1.74
1958	726	35,558	2.04
1959 (Projected)	612	47,124	1.30

Direct assistance was given to St. Elizabeths Hospital in establishing an insect and rodent control program and in training members of a new insect and rodent control crew.

EQUIPMENT TESTING AND QUALITY CONTROL SECTION

Routine conductivity testing of centrally distilled waters was continued daily in the Clinical Center and at weekly intervals in other NIH buildings. These tests helped locate defects in central stills and formed the basis for the Section's weekly distilled water quality reports to the Institutes. Three surveys of trace copper ion content were made to help guide the DRS in retinning, or replacement, of components in the central distilled water systems. A weekly production performance check of each of the six stills in the Clinical Center distilled water system was also conducted to minimize distilled water shortages in this building.

A layout with specifications for a second 1,000 gallon-per hour capacity mixed-bed deionizer in the Clinical Center was prepared to insure an uninterrupted supply of high purity water to the Central Glassware cleaning, Pharmacy, and Media Preparation Facilities. Installation of this equipment was completed by PEB by the end of the year.

Specifications for a General Purpose Liquid Cleaner were improved to obtain a more uniform product. Shipments of both this cleaner and the standard detergent used for laboratory glassware and cage cleaning were tested for compliance with specifications.

A study of corrosion conditions in a main exhaust duct from a Kjeldahl unit in the Clinical Center was completed, including evaluation of a Kjeldahl fume scrubber. Serious duct corrosion, due to fume hood operation, was also discovered during the study.

A survey of polyethylene waste piping installations at several industrial and institutional research laboratories was made to determine the suitability of this material for use at NIH. A report on this survey pointed out what further information was required and recommended specific test installations at NIH.

Functional layouts and specifications were prepared and performance tests were conducted on a variety of steam pressure sterilizers, gas sterilization equipment, machines for cleaning laboratory glassware and animal cages, water stills and deionizers, and related equipment.

GERM-FREE SERVICES SECTION Irradiation sterilizing and packaging procedures, developed by the Section and the NCI Radiation Branch for germfree animal diets, are now routinely used to meet a number of diet requirements among NIAID, NIAMD, and NIDR germfree investigations (See Project Report). The increased use of irradiation sterilized diets is reflected in the following diet production records: 1958 (Jan.-June)-66 kg.; 1958 (July-Dec.)-127 kg.; 1959 (Jan.-June)-178 kg.; and 1959 (July-Nov. 20)-222 kg.

The Section cooperatively developed arrangements for the Second Symposium on Gnotobiotic Technology held at the University of Notre Dame, April 8 and 9. A scientific exhibit on germfree technology was prepared for the meeting with the assistance of the Medical Arts Section.

Plastic germfree chambers enjoyed a wider use during the year and the Section was able to assign its three Trexler flexible-film units to investigators for short-term studies. Two of these units are currently in use.

Various engineering services were performed for germfree investigators. Among these were plant inspections of nine Reyniers type chambers for NIAMD and NIAID. Layout and equipment drawings and specifications for the proposed expansion of the NIAID area in Building 8 were prepared and assistance was given the proposed enlarged germfree area in Building 4.

As the year progressed, and as the NIH germfree research efforts became more decentralized, the workload pattern for the Section showed an increasing need for engineering and related technical service.

In collaboration with the Environmental Health Section, a commercially available bacteriological safety hood was modified to serve as a prototype unit for investigations employing tubercle bacillus organisms.

At the request of the Air Pollution Medical Branch of the Division of Special Health Services, BSS, the Branch's animal room facilities at the Robert A. Taft Sanitary Engineering Center were surveyed and a report was prepared as to their suitability for animal exposure studies.

Numerous individuals and groups of visitors were shown the Building 10 germfree facilities and, in addition, two closed circuit television programs were originated from this germfree area.

INTERSECTIONAL AND BRANCH OFFICE Three of the Branch's Sections collaborated in a joint study and report with the Department of Clinical Pathology, CC, which was aimed at assessing the bacteriological integrity of surgical perfusion procedures.

Under the joint auspices of the Clinical Center and the DRS, the Branch Office facilitated arrangements leading to the visit of Dr. Robert Blowers, Public Health Laboratory Service, British Ministry of Health, to the NIH in October. Consultations with Dr. Blowers resulted in enlarging our present concepts of the role of air-borne contaminants in surgical infections and in receiving valuable recommendations regarding modifications to the design of the surgical wing.

The Branch Office, with the assistance of the NIH Management Analysis Section, established criteria for a proposed NIH food service facilities study, and investigated consultants qualified for this purpose.

Numerous written inquiries and visitors requesting information on laboratory design and hospital design and sanitation problems were handled throughout the year by the Branch Office and the Sections.

Additionally, staff members presented a number of lectures to NIH personnel during the year and attended various training programs, including the following:

Title of Course	SEB Staff Members
Communicable Disease Center's two-week course, "Identification and Biology of Arthropods ...	1
DRS Technical Writing Courses	3
The Bristol Company's two-week "General Instrument Course"	1
Robert A. Taft Sanitary Engineering Center's two-week course, "Basic Radiological Health".	1
NIH eight-week course ($1\frac{1}{2}$ hour sessions), "Negotiated Contracting"	1
Communicable Disease Center's two-week course, "Insect Control"	1
The Armed Forces Pest Control Board's two-week course, "Military Entomology"	1
14th Annual ISA Instrument Automation Conference and Clinical Workshop (9/20-25)...	1

Major Problems and Program Objectives

Personnel Recruitment. The Branch's inability to successfully recruit for two analytical and physical chemist positions remains its most substantial personnel problem. Due to this its research projects on the removal of trace contaminants from laboratory glassware surfaces and high quality steam for laboratory use have not been active during the past year.

Insect and Rodent Control. Crowding in laboratory areas, first mentioned in the Branch Annual Report for 1958, continues to add to cleaning problems and contribute to the increased incidence of insects. Apparent additions to workloads for laboratory service personnel, and especially animal room attendants, are other factors which militate against proper laboratory housekeeping and sanitation. The increase of insect prevalence is considered symptomatic of these more basic problems. The Branch intends to spend more time on these matters while carrying out the more traditional elements in its insect and rodent control program.

Germfree Animal Supply. Late in the year information was received of possible retrenchments in the supply of germfree animals from the LOBUND Institute, University of Notre Dame. Plans are being made, simultaneously, to evaluate the LOBUND-developed jacket isolator and utilize it for rat breeding purposes.

Germfree Chamber Monitoring. During the coming year one of the major problems facing the Branch's Germ-Free Services Section will be to develop a germfree chamber monitoring system sufficiently adaptable to serve as a means for monitoring other critical equipment, particularly during nights and weekends. The possibility of utilizing the system for transmitting information to remote recording points will also be investigated.

Environmental Health Program. The Branch continued its study of how a more effective environmental health program could be developed to meet the special needs of the NIH.

Serial No. DRS-6.1
1. Sanitary Engineering Branch
2. Equipment Testing and
Quality Control Section
3. Bethesda 14, Maryland

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: EVALUATION OF GAS STERILIZATION EQUIPMENT.

Principal Investigator: Harry Stierli, Sr. San. Engineer

Other Investigators: Dr. L. G. Herman, Bacteriologist, GS-12
George Elmore, Asst. San. Engineer
Frank Morelli, Bacteriologist, GS-7
J. Paul Davies, Engineering Aid, GS-7

Cooperating Units: None

Man Years (Calendar Year 1959):

Total:	0.5
Professional:	0.4
Other:	0.1

Project Description: (See attached material)

Part B. included: Yes [✓ No]

A. EVALUATION OF GAS STERILIZATION EQUIPMENT

Objectives:

To study recently developed gas sterilization equipment and methods, and to determine criteria for their safe and effective use in various applications.

Methods Employed:

Gas sterilization equipment ranging in size from a one-liter capacity portable unit to a large walk-in type chamber of about 425 cubic foot capacity are under study. A variety of materials and apparatus together with representative test organisms are exposed to a range of conditions to determine the effect of the gas on microorganisms and exposed materials. Ethylene oxide gas concentrations were determined within the steriliser chamber using gas chromatography methods. Simultaneous relative humidity measurements were made using an electric hygrometer.

Major Findings:

A report has been completed covering evaluation of the microbicidal effectiveness, mechanical reliability, and safety of an automatic control type commercial gas sterilizer utilizing an ethylene oxide-Freon mixture. The detailed material contained in this report is being condensed for publication.

The large walk-in steam pressure sterilizer equipped for use with an ethylene oxide-carbon dioxide mixture was found to provide reliable gas sterilization of oxygen tents and other large items with a 24-hour exposure at normal room temperature of approximately 75°F. Samples of gas taken from several representative locations in the chamber indicated that the ethylene oxide was uniformly distributed throughout the chamber during the entire sterilization period.

Significance to DRS Program:

As a result of the study, gas sterilization methods and equipment utilizing non-flammable mixtures of ethylene oxide and diluent are now routinely used at the NIH for sterilization of plastic components of the heart-lung machine, heart catheters, infected oxygen tents and books, and other heat sensitive materials.

Proposed Course of Project:

New gas-sterilization methods and equipment will continue to be studied. The practicability of producing a sterile, assembled heart-lung machine using gas sterilization techniques will be investigated. Development of reliable and safe methods of disinfecting heat sensitive materials with gas, using simple low-cost devices, will be further explored.

Serial No. DRS-6.2
1. Sanitary Engineering Branch
2. Equipment Testing and
Quality Control Section
3. Bethesda 14, Maryland

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: STUDY OF DISTILLED WATER AND DEIONIZED WATER QUALITY.

Principal Investigator: Harry Stierli, Sr. San. Engineer

Other Investigators: George Elmore, Asst. San. Engineer
Harry Ettinger, Asst. San. Engineer
J. Paul Davies, Engineering Aid, GS-7

Cooperating Units: None

Man Years (Calendar Year 1959):
Total: 0.3
Professional: 0.2
Other: 0.1

Project Description: (See attached material)

Part B. included: Yes [✓ No]

B. STUDY OF DISTILLED WATER AND DEIONIZED WATER QUALITY.

Objectives:

To continue investigation of distilled and deionized water production, storage, and distribution problems with the aim of improving the quality of centrally produced waters so that they can be used with a high degree of confidence in medical research.

Methods Employed:

Conductivity checks are routinely made on a variety of distilled and deionized water systems to indicate the quality of water produced. Traces of copper in these process waters are detected using a semi-quantitative spot test, and , when necessary, are supplemented with spectrophotometric analysis.

Major Findings:

The specific resistance of distilled waters in the special central systems of Buildings 2 and 4 were normally found to be 1,000,000 ohms or higher. Other central NIH distilled water systems contained water of not less than 500,000 ohms specific resistance except for occasional breakdowns in equipment. Water from mixed-bed type deionizers was maintained at specific resistances of at least 1,000,000 ohms.

Samples of centrally distilled waters at the NIH normally were found to contain less than 0.01 PPM of copper. During the year a few samples indicated copper contents in the range of 0.01 to 0.1 PPM.

Significance to DRS Program:

Distilled and deionized waters of consistent excellent quality are essential for support of medical research. The conductivity checks and copper tests serve as initial quality controls for these special process waters.

Proposed Course of Project:

Water from various stills and deionizer systems will continue to be tested for ionizable solids and trace contaminants. Sources of contaminants and methods of their elimination or reduction will be studied. Biological indicators involving tissue cultures and enzymes, will be investigated as sensitive methods for allowable amounts of contaminating substances.

Serial No. DRS-6.3
1. Sanitary Engineering Branch
2. Germ-Free Services Section
3. Bethesda 14, Maryland

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: GERM-FREE SYSTEMS RESEARCH AND DEVELOPMENT.

Principal Investigator: John L. S. Hickey, Sr. San. Engineer

Other Investigator: Donald L. Snow, Sanitary Engineer Director

Cooperating Units: NIDR, NIAMD, and NIAID are cooperating in an advisory capacity in field trial evaluation of equipment developed. These institutes have no serial numbers for project.

Man Years (Calendar Year 1959):
Total: 0.3
Professional: 0.2
Other: 0.1

Project Description: (See attached material)

Part B. Included: [✓ Yes] No

C. GERM-FREE SYSTEMS RESEARCH AND DEVELOPMENT.

Objectives:

To develop and evaluate germfree systems capable of supplying germfree animals in chambers which are conveniently transportable, easily operated, economical and adaptable to the requirements of NIH investigators.

Methods Employed:

(a) Operation and evaluation of existing types of equipment; (b) consultation with NIH investigators to determine their particular equipment needs; and (c) design, and procurement of special equipment, plus field evaluation of applicability of equipment to specific research.

Major Findings:

Extensive use of peracetic acid as a germicide in germfree operations has confirmed it to be satisfactory and to have several advantages over other materials used. Its use has caused a revision in concept as to types of equipment suitable for germfree investigations.

Thin rigid plastic germfree units, though they could be kept sterile, failed after several months due to cracking and failure of the plastic. Future rigid plastic germfree chambers will be fabricated with thicker walls and floors.

The need for several modifications to existing equipment to increase convenience and efficiency has been demonstrated by long-term use. These are incorporated into succeeding tank designs as tank needs develop.

Significance to DRS Program:

Development of inexpensive, safe, and convenient equipment for use by the scientist is a requisite to expansion of research utilizing germfree animals. Chambers fulfilling these criteria will eliminate the present requirement of a centralized experimental area by making available to the investigator germfree equipment designed for use in a laboratory module. The decentralization concept, made possible by these newer types of chambers, should permit more investigators in a greater number of research fields to seriously consider the use of germfree animals.

Proposed Course of Project:

An increased use in flexible film plastic germfree chambers, with extended use of chemical germicides is planned.

It is also planned to obtain a portable plastic jacket isolator of the type developed at Notre Dame University and test its applicability for breeding of germfree rats and/or mice.

Modifications to existing equipment to suit varied and changing needs will continue as the need arises.

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Part B. Honors, awards, and publications

Publications other than abstracts from this project:

1. Snow, D. L., and Hickey, John L. S. Organizing for Germfree Research, Proceedings of the Second Symposium on Gnotobiotic Technology. University of Notre Dame, 1959.

2. Hickey, John L. S. A Comparison of Current Types of Germfree Research Apparatus, Proceedings of the Second Symposium on Gnotobiotic Technology, University of Notre Dame, 1959.

3. Horton, R. E., and Hickey, John L. S., Design and Operation Features of Isolation Units and Accessories for Germ-Free Animals, Germ-Free Animal Studies, University of Pennsylvania Project, WRAIR, Sept. 1955 - May 1958.*

Honors and awards relating to this project: None.

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* Report completed in 1958 but not previously included in Annual Report.

Serial No. DRS 6.4
1. Sanitary Engineering Branch
2. Germ-Free Services Section
3. Bethesda 14, Maryland

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: GERM-FREE GUINEA PIG DIET DEVELOPMENT.

Principal Investigator: John L. S. Hickey, Sr. San. Engineer

Other Investigators: Dr. R. E. Horton, Laboratory of Germfree
Animal Research, NIAID
(NIAID Project No. NIAID-111)

Cooperating Units: Dr. H. L. Andrews, Radiation Branch, NCI
Mr. E. G. McDaniel, LNE, NIAMD

Man Years (Calendar Year 1959):
Total: 0.4
Professional: 0.2
Other: 0.2

Project Description: (See attached material)

Part B. included: [✓ Yes] No

D. GERMFREE GUINEA PIG DIET DEVELOPMENT.

Objectives:

To develop a nutritionally well-defined diet which will produce a healthy germfree guinea pig, with growth and other characteristics approaching those of the normal animal.

Methods Employed:

Activities this year have been directed toward the study of irradiation sterilization of guinea pig diets, and have included: (1) preparation of a complete semi-synthetic diet; (2) study to determine the minimum irradiation dose to achieve sterilization of diet; (3) further development of control techniques to insure sterility of diets; and (4) testing of diets on germfree animals both from a nutritional and sterility standpoint.

Major Findings:

It was found that uniform sterilization of 1 cm. thick plastic-packaged diets could be achieved with an irradiation dose of two million rad.

An irradiation sterilized semi-synthetic diet was observed to be much more satisfactory for the germfree guinea pigs than the irradiation sterilized natural diet with fresh vegetables used in 1958. Over 400 kilograms of this diet were sterilized by irradiation in 1959 for germfree and control guinea pigs.

Significance to DRS Program:

Development of a germfree guinea pig diet which will produce guinea pigs physically and physiologically resembling their conventional counterparts will reinforce the usefulness of experimental data obtained with these animals. Such a normalizing diet would make work with germfree guinea pigs more desirable to investigators and for proposed DRS germfree animal breeding operations.

Proposed Course of Project:

Development of a suitable germfree guinea pig diet will continue. Factors which will be studied are: (1) further safe reductions to minimum irradiation dose which will consistently sterilize diets; (2) ability of irradiation sterilized diets to support reproduction in germfree guinea pigs; and (3) application of irradiation sterilization methods to sterilization of synthetic and natural diets for germfree rats.

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part B. Honors, awards, and publications.

Publications other than abstracts from this project.

1. Horton, R. E., and Hickey, John L. S. *Irradiated Diets for Rearing Germfree Guinea Pigs.* Accepted for publication in *Animal Care Panel Proceedings*, 1960.

Honors and awards relating to this project: None

Serial No. DRS-6.5
1. Sanitary Engineering Branch
2. Environmental Health Section
3. Bethesda 14, Maryland

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: EVALUATION OF DETERGENT-SANITIZER COMPOUNDS FOR USE IN THE CLINICAL CENTER

Principal Investigator: Dr. L. G. Herman, Bacteriologist, GS-12

Other Investigators: Mr. Frank Morelli, Bacteriologist, GS-7
Mr. George Elmore, Asst. Sanitary Engineer

Cooperating Units: Housekeeping Section, CC (No Serial No.)
Mrs. Emma Karch, Executive Housekeeper

Man Years (Calendar Year 1959):

Total:	0.2
Professional:	0.05
Other:	0.15

Project Description: (See attached material)

Part B. included: Yes [✓ No]

E. EVALUATION OF DETERGENT-SANITIZER COMPOUNDS FOR USE IN THE CLINICAL CENTER

Objectives:

To study the efficiency of various types of phenolic-based detergent-sanitizer solutions in removing soil and inhibiting microbial growth on floor and wall surfaces in the Clinical Center.

Methods Employed:

Tests to date have been preliminary and have involved swabbing procedures and selective media for screening purposes.

Major Findings:

Preliminary screening of a detergent-sanitizer for damp mopping of floors in the patient care areas points to an improvement over the use of a detergent alone, as demonstrated by a definite reduction in bacterial numbers on the floor areas.

Significance to the DRS Program:

The utilization of a highly effective detergent-sanitizer in the Clinical Center should result in better sanitation, and a lessened potential for cross infections through a more satisfactory method of controlling microbial contamination in the patient care areas.

Proposed Course of the Project:

Bacteriological swabbing of selected floor areas in the Clinical Center will be conducted before and after cleaning with a detergent and before and after cleaning with various detergent-sanitizers. Tests will be carried out in accordance with an experimental design now being developed. Observations of the effects of these materials on floor finishes will be made concurrently.

Serial No. DRS-6.6
1. Sanitary Engineering Branch
2. Environmental Health Section
3. Bethesda 14, Maryland

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: EVALUATION OF FILTERS IN PORTABLE VACUUM CLEANERS TO PREVENT THE REDISPERSION OF VIABLE ORGANISMS IN PATIENT CARE AREAS.

Principal Investigator: Dr. L. G. Herman, Bacteriologist, GS-12

Other Investigators: Mr. Frank Morelli, Bacteriologist, GS-7
Mr. John L. S. Hickey, Senior Sanitary Engineer

Cooperating Units: None

Man Years (Calendar Year 1959):

Total:	0.05
Professional:	0.02
Other:	0.03

Project Description: (See attached material)

Part B. Included: Yes [✓ No]

F. EVALUATION OF FILTERS IN PORTABLE VACUUM CLEANERS TO PREVENT THE REDISPERSION OF VIABLE ORGANISMS IN PATIENT CARE AREAS.

Objectives:

To study the efficiency and other characteristics of multi-layered glass wool filter pads in removing dust and bacterial cells from the exhaust air of a portable vacuum cleaner.

Methods Employed:

A stock model, portable, heavy-duty vacuum cleaner provided with three glass fiber filters was studied. The filter pads and filter assembly were initially sterilized with ethylene oxide, installed in the cleaner and then used for a month's routine operations. At weekly intervals, the upstream face of each pad was swabbed. The swabs were streaked on blood agar plates and incubated at 37°C. and growth was observed.

Major Findings:

These studies are a continuation of earlier work within the Branch which concluded that an addition filter was required on a standard, portable vacuum cleaner to permit its use in patient care areas. After a month's use of the vacuum cleaner with a multi-layered final filter under extreme loading conditions, only a slight discoloration was noted on the upstream face of the first pad. The two remaining pads were not discolored and bacteria could not be recovered from them.

Significance to the DRS Program:

The NIH is now able to use specially equipped portable vacuum cleaners with a greater degree of confidence that their exhaust air streams are substantially free from dust and bacteria under dry pick-up conditions. The use of this machine reduces to a minimum practical level the hazard of redispersing viable organisms from the floor to the air in laboratory and patient care areas not equipped with central vacuum cleaning systems, or where for other reasons the central systems cannot be used.

Proposed Course of the Project:

Studies will be extended to include conditions of wet pick-up. The increased possibilities for mold or bacterial growth and/or penetration through the filter pads with added moisture present will be investigated.

Serial No. DRS-6.7
1. Sanitary Engineering Branch
2. Environmental Health Section
3. Bethesda 14, Maryland

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: THE USE OF BETA PROPIOLACTONE FOR AREA STERILIZATION.

Principal Investigator: Dr. L. G. Herman, Bacteriologist, GS-12

Other Investigators: Mr. Frank Morelli, Bacteriologist, GS-7

Cooperating Units: None

Man Years (Calendar Year 1959):
Total: 0.05
Professional: 0.03
Other: 0.02

Project Description: (See attached material)

Part B. included: Yes [✓ No]

G. THE USE OF BETA PROPIOLACTONE FOR AREA STERILIZATION.

Objectives:

To evaluate the use of Beta propiolactone as a rapid method for sterilizing laboratory areas and their contents.

Methods Employed:

The area to be sterilized was taped and sealed with plastic film and humidified above the 90 percent relative humidity level. Beta propiolactone was added by means of a misting unit at the rate of 10 mg. per liter of air. Swabs were taken from various surfaces before and after exposure to Beta propiolactone and cultured to determine the bacterial population.

Major Findings:

Two laboratories were sterilized and the swab tests of the two laboratories treated demonstrated an effective bacterial kill and confirmed earlier studies reported by Fort Detrick investigators.

Significance to DRS Program:

Test results indicate that Beta propiolactone may be a useful material for decontaminating surfaces in laboratories and patient care areas where highly pathogenic bacteria may be difficult to otherwise safely handle.

Proposed Course of the Project:

Whether this study should be continued is now under consideration. Information recently received points to the possible role of Beta propiolactone as a carcinogen. Therefore, relative benefits and risks of using this material must be evaluated before the study is continued.

Serial No. DRS-6.8
1. Sanitary Engineering Branch
2. Environmental Health Section
3. Bethesda 14, Maryland

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: AIR-BORNE MICROBIOLOGICAL CONTAMINATION IN SELECTED PATIENT ENVIRONMENTS.

Principal Investigator: Dr. L. G. Herman, Bacteriologist, GS-12

Other Investigators: Mr. John L. S. Hickey, Sr. San. Engineer
Mr. Frank Morelli, Bacteriologist, GS-7

Cooperating Units: None

Man Years (Calendar Year 1959):

Total:	0.08
Professional:	0.04
Other:	0.04

Project Description: (See attached material)

Part B. included: Yes [✓ No]

H. AIR-BORNE MICROBIOLOGICAL CONTAMINATION IN SELECTED PATIENT ENVIRONMENTS.

Objectives:

The project is concerned with: (1) assessing the most prevalent types, ranges in numbers, and other characteristics of air-borne microorganisms found in selected NIH patient environments; and (2) evaluating to what extent changes in the patient environment and patient care can significantly alter air-borne contamination.

Methods Employed:

A combination of air-sampling procedures is being employed to develop complete information on air-borne contamination, settling rates, and possibilities for contaminant redispersal in each type of patient care area.

Sampling procedures consist of the inertial impaction method (slit samplers) and gravity method (settling plates).

Major Findings:

Both slit sampling plate and settling plate data show to date that S. albus is the predominant organism collected in all NIH areas tested. This suggests a possible application of S. albus as an "indicator" or integrator organism for personnel activity, personnel dress, and other variables.

Significance to IRS Program:

Studies of air-borne contamination are one facet in the overall control of the patient care environment. The complete control of the physical environment is a direct responsibility of the IRS.

Proposed Course of Project:

A study of the microbial population in the air, including the correlation of various factors in their production and dispersion, e.g., types of clothing worn by personnel; the numbers of staff members present in an area; and the microbial population of the floor and wall surfaces, will be continued in various types of patient care areas. The inertial impaction samplers and open plates will be used to determine how contamination levels vary through changes in the factors under study.

Serial No. DRS-6.9
1. Sanitary Engineering Branch
2. Office of the Chief
3. Bethesda 14, Maryland

PHS -- NIH
Individual Project Report
Calendar Year 1959

Part A.

Project Title: THE EFFECTS OF VENTILATION AND OTHER VARIABLES IN THE BACTERIOLOGICAL QUALITY OF AIR AT THE SURGICAL WOUND SITE.

Principal Investigator: Donald L. Snow, Sanitary Engineer Director

Other Investigators: Dr. L. G. Herman, Environmental Health Section
John L. S. Hickey, Germ-Free Services Section

Cooperating Units: None

Man Years (Calendar Year 1959):
Total: 0.15
Professional: 0.15
Other: 0.0

Project Description: (See attached material)

Part B. included: Yes [✓ No]

I. THE EFFECTS OF VENTILATION AND OTHER PHYSICAL VARIABLES IN THE BACTERIOLOGICAL QUALITY OF AIR AT THE SURGICAL WOUND SITE.

Objectives:

The general goal of this project is to study how the risk of air-borne infection in the new NIH Surgical Wing for the Clinical Center can be minimized by ventilation methods and other physical variables. Specifically, the studies will test a new ventilation design aimed at maintaining a low level bacterial content of the air immediately surrounding the wound site. Adjunctive ultra-violet air irradiation will also be studied.

Methods Employed:

To date, project activity has centered on the empirical design of the ventilation system for the new Surgical Wing. Earlier tests of the bacterial content of the air in the present Clinical Center operating suite were made to establish the various factors influencing air quality in operating rooms.

Dr. Robert Blowers, British Medical Research Council, was retained as a consultant to review the plans for the new Surgical facilities and to advise on his earlier studies on optimum air flow patterns in operating rooms.

Major Findings:

Through consultations above, the significant relationship of air exhaust provisions to room air quality was established and changes have been recommended to the Surgical Wing design.

Significance to DRS Program:

The design and construction of surgical facilities which offer a maximum protection for the patient against infection is of concern to DRS in its research facilities construction and maintenance program.

Proposed Course of Project:

Project contemplates an initial series of tests aimed at producing bacterial aerosols having a standard particle size and uniform settling rates. Tests in new operating facilities will then involve releasing standard aerosols and carrying out air sampling determinations under varying ventilation conditions. Tracer gases and conductivity cells may be used as an alternate method to determine air-borne bacterial suspension dilution rates at different points within the operating room.

December 1959 Calendar Year 1959

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

DIVISION OF RESEARCH SERVICES

Summary of Branch Activities 1. DRS-7
Serial Number

2. RESEARCH FACILITIES PLANNING BRANCH 2. A. E. Williamson
Branch Chief

Objectives

To plan and construct new research facilities as required by the new and expanding needs of NIH.

Programs

To serve as the focal point at NIH for the assembly and correlation of all information required in programing and planning the construction of all new and additional research facilities that require the participation of the Public Buildings Service, General Services Administration and of all new and additional temporary construction of research facilities.

To provide the major contact point for coordination between the Public Buildings Service or contract architect and the appropriate NIH division during the planning and construction of a research facility until it is occupied by NIH.

Progress and Accomplishments

In order to handle more efficiently an increasingly heavy workload, the work of the Branch was split into two major areas of responsibility, design and construction. These functions are handled in a Design Section, and a Construction Section which were created to implement the change. The Design Section has the responsibility for the development and design of new research facilities, and the Construction Section is responsible for the inspection and engineering audit of facilities already under construction. The reorganization has been helpful in administering the over-all programs of the Branch, and should be more beneficial in the coming year as functional overlapping is eliminated.

Staff Status - Personnel changes have been numerous during the year. In the majority of cases these are attributable to completion of tours of duty by junior reserve officers and transfers to accept higher grades on the part of the secretarial staff. The present staff consists of Branch Chief, two Section Chiefs, four junior engineers and four secretaries. Two junior engineer vacancies exist.

New Construction - See attached tabulation.

DESIGN

Refrigeration Plant (11-C Extension)

Preliminary report covering scope of addition to Building 11 in accordance with the "Master Plan of Utilities" has been approved. Design of the extension is now under negotiation with a consultant.

DEVELOPMENT

Master Site Plan of the NIH reservation was revised reflecting changes which had occurred since the original site plan was prepared in August 1958.

Revision of NIH Reservation Model

Revision of the model of the NIH reservation is underway. This revision will reflect changes which have occurred since the original model was constructed several years ago.

NIH Animal Farm

RFPB activities on this project include to date: (1) preliminary cost estimates for some of the basic utilities; (2) preliminary cost estimates for facilities required by NIMH-NINDB; (3) preliminary water supply report; (4) preparation of specifications for topographic mapping; (5) selection of a consultant for development of a program of requirements.

Vibration Study (30)

A study of vibration problems in the operation of microtomes now in use by the Dental Institute in Building 2 was made. This study revealed that similar problems might be encountered when the Dental Institute moves to its new location in Building 30. On the basis of this, an additional study was recommended to determine the most satisfactory location for the microtomes within Building 30 which will be the new home of the Dental Institute.

Simultaneous Translation System

A cost estimate for a simultaneous translation system suggested for installation at NIH was prepared.

Neurophotography (10-A)

The New Surgical Wing (Bldg. 10-A) contains a provision for a photographic area in the neurosurgical suites. The design of this facility is being performed by the Instrument Section and coordinated by RFPB.

Pneumatic Tube System

Original plan for the pneumatic tube extension serving Buildings 29 and 30 was not acceptable to OAM. The system was redesigned with operation guaranteed by contractor.

Surgical Suite Consoles (10-A)

Design, development and fabrication of prototype consoles for use in surgical suites is underway through the services of a consultant.

Cardiac Surgical Suites (10-A)

The problems of providing lighting, photographic, television and observation ports and air conditioning from the circular opening in the ceiling areas for the cardiac surgical suites were investigated by RFPB. Lighting fixtures based on original investigation are now being fabricated. Coordination of all problems is being accomplished through a consultant contract. All basic data have been supplied to the architect for development of final plans.

Cage Washing Facility (Bldg. 14, Wings F & G)

Plans and specifications prepared in 1957 have been reviewed by RFPB and SEB for converting temporary offices to animal quarters and adding a cage washing building. Plans will be brought up to date by the Public Buildings Service in the near future.

Water Supply and Sanitary Sewerage

Through a consultant contract investigations were completed covering NIH's current and long-range water supply and sanitary sewerage requirements. An as-built survey of water distribution and sanitary sewerage systems was completed through use of COSTEP personnel.

Problems

Personnel - Difficulty is being experienced in recruiting junior engineers either as commissioned officers or through Civil Service. This is apparently the case in many PHS programs. Complicating the problem still further is an apparent reluctance by PHS to recruit from mechanical and electrical engineering graduates although this Branch is one of the few currently that requests engineers with these backgrounds. RFPB believes that broadening the basis for a future in engineering in the Public Health Service would demonstrate that mechanical and electrical engineering graduates would be just as effective as those trained in other intra-engineering disciplines.

Public Buildings Service - NIH Relationship

Some difficulties were encountered during the year in connection with financing of building construction. In order to prevent a recurrence of an overexpenditure which did occur last May, the Branch has been keeping its own records on contingency items of the construction accounts. This has been helpful in overcoming a communication gap in over-all financing which has existed between PBS and the Branch. PBS has primary responsibility for construction financing, NIH secondary responsibility.

Project Implementation - RFPB has little direct authority to act on construction matters, and each new decision must receive approval of PBS before action can be taken. This has resulted in some inordinate delays which need not have occurred had a more direct means of implementing changes been available. Changes in personnel and agency responsibility within PBS have aggravated the problem materially. The Branch will have as one of its major problems in 1960, the one of further improving the lines of communication between it and PBS which will in turn help in getting the over-all job done more quickly.

Changes and Improvements

Personnel - While there has been nearly a complete turnover of junior engineers the present officers exceed the average of their predecessors in effort, interest and ability to foresee problems in design and construction.

Office Space - Larger quarters have been provided which resulted in better efficiency and closer relationship with local PBS representatives.

Financial Control - While admittedly a make-shift arrangement, the informal construction accounts of RFPB do provide a measure of control over construction funds. Over expenditures now seem preventable.

Training - A plan for providing junior officers with additional training is ready for implementation subject to availability of funds. Also, the use of COSTEP trainees was successful during the summer months, resulting in excellent training for undergraduate engineers and a real accomplishment in developmental work for the NIH reservation. This program will be continued if funds are made available.

NEW CONSTRUCTION

iding	Architect	Plans Completed	Contract Awarded	Contractor	Amount	Completion Date	Percent Complete
Surgical Wing (10-A)	Kiff, Colean, Voss, Souder	2/4/59	6/25/59	Dean Const. Co.	$1,513,828	12/7/60	14
er Plant Extension A) - 1st Ext.	PBS	7/1/57	5/28/58	Grunley, Walsh and Blanche	341,400	8/1/59	100
Plant - 7th pressor (11-B) - 2nd Ext.	PBS	5/15/59	7/6/59	W. G. Cornell Company	217,430	4/12/60	0
vision of Biologics ndards (29)	Ted Englehardt	9/27/57	2/26/58	Norair Engr. Corp.	2,360,550	4/30/60	82
ntal Research Labora- ry (30)	Ted Englehardt	10/22/58	3/25/59	Norair Engr. Corp.	2,370,798	1/25/61	27
eneral Office Building 31)	Keyes, Leth- bridge, Condon	5/11/59	9/4/59	Norair Engr. Corp.	7,188,548	7/23/61	3
earch Greenhouse A))	Ronald S. Senseman	5/26/58	6/27/58	James L. Partello Co.	115,459	1/28/59	100
tional Library of dicine (38)	O'Connor and Kilham	-	6/2/59	Arthur Venneri Co.	4,464,988	7/1/61	16

Notes: **Observations**

10-A Progress satisfactory although 7% behind schedule. Complex nature of mechanical and electrical installations probably will cause increasingly difficult construction problems in the future.

11-A Provides 1050 tons capacity and space for an additional unit of 1050 tons.

11-B Provides air conditioning for Bldgs. #30 and #38 (1050 tons capacity).

29 Project experienced major strike delays early in 1959 until new local labor contracts were signed for all skills. Other delays have been caused by rejection and replacement of all windows shipped to site and poor coordination on part of Architect and PBS for approval of plans. Major changes during construction resulted in over commitment of contingency funds which were known to be inadequate at time of contract award.

30 Progress 5% behind schedule due to complex nature of structure.

31 Progress 1% behind schedule. Office layouts being prepared to be complete 3/1/60.

38 Progress 3 % behind schedule due to large amount of rock excavation. RFPB representing NLM for construction phase only due to NIH responsibility of providing future operation and maintenance services.

Annual Report of Activities
Division of General Medical Sciences
Calendar Year 1959

SUMMARY STATEMENT

During the past 12 months the Division of General Medical Sciences has grown markedly in program activities and in budget, with some increases also in personnel.

In accordance with the original plan in the establishment of the Division in July 1958, DGMS has the administrative responsibility for the grant programs in the basic medical and biological sciences, in environmental and public health, and in certain clinical areas not covered by the programs of the Institutes. The Division also administers the grant programs for training investigators in the basic biomedical sciences, provides fellowships for general research training and directs the NIH Center for Aging Research.

In addition, in October 1959, the Division was assigned the NIH administrative responsibility of developing the program for Clinical Research Facilities.

Budget

The following figures summarize the budget of the Division over the past three years:

	FY 58	FY 59	FY 60	FY 61 (Est.)
Research Grants	$ 9,467,579	$16,620,999	$23,559,000	$26,446,000
Training Grants	2,960,923	6,039,125	13,040,000	11,540,000
Res. Fellowships	1,997,470	3,259,640	5,310,000	5,310,000
Review & Approval	467,545	801,895	1,280,000	1,342,000
TOTAL	$14,893,517	$26,721,659	$43,189,000	$44,638,000

Personnel

At the end of calendar year 1958, there were 45 persons employed in the Division. At the end of calendar year 1959 there were 69 persons in the Division, assigned as follows:

Office of the Chief	3
Administrative	13
Information	4
Research Grants Branch	14
Research Training Branch	31
Center for Aging Research	4
Total	69

RESEARCH GRANTS

During the past year the Research Grants Branch, which, as of December 31, 1959, was supporting more than 1,100 grants, organized its responsibilities into six main divisions, as follows:

Chemistry of Life Processes, including biochemistry, pharmacology, metabolism, nutrition, immunochemistry, etc. Approximately 22 percent of DGMS research grant funds are going into this area.

Biology of Human Development, including physiology, cell biology, genetics, reproduction and development, microbiology, histology, entomology, etc. Approximately 21 percent of DGMS research grant funds are going into this area.

Environmental Health, including air pollution, water pollution and sewage disposal, food technology and contamination, occupational medicine, radiation, toxicology, accident prevention, etc. Approximately 21 percent of DGMS research grant funds are going into this area.

Public Health, Medical Care and Nursing, including general public health research, rehabilitation, epidemiology, medical care administration, facilities and services, etc. Approximately six percent of DGMS research grant funds are going into this area.

Clinical and Preclinical Sciences, including endocrinology, pathology, anatomy, hematology, anesthesiology, pediatrics, surgery, orthopedics, obstetrics and gynecology, dermatology, forensic medicine, etc. Approximately 10 percent of DGMS research grant funds are going into these areas.

Methods and Tools of Science, including biophysics, instrumentation and methods, biometry and statistics, conferences, handbooks, publications, etc. Approximately 15 percent of DGMS research grant funds are going into these areas.

During the year the Research Grants Branch completed development of a McBee Keysort system for content and fiscal analysis of all its grants. Space is provided on the cards for the classification of 98 disciplines or fields of interest, together with the following

information pertaining to the grant: number; priority; the Study Section involved and its action; principal investigator, co-investigator, sponsoring institution, pertinent financial actions, Council actions over a period of at least four years, and other information.

December 31 Level of Activity

As of December 31, 1959, out of the FY 1960 research grant budget for DGMS, $19,940,526 had been expended as the result of actions by the National Advisory Health Council in June 1959 and November 1959. This expenditure is made up of 1,179 grants, of which 349 were new in FY 1960. Expenditures for the new grants totaled $6,815,195.

Cooperation with BSS

DGMS is assigned the bulk of the NIH responsibility for research grants in the fields of air and water pollution. Because these programs have been funded under dual appropriations (Sanitary Engineering Activities, and General Research and Services), the Research Grants Branch and the Office of the Chief, DGMS, have worked in close cooperation with the Bureau of State Services in administering grants in these areas. In fiscal year 1958, for example, BSS provided $650,000 for research grants in air pollution and $147,500 for projects in water pollution; and $271,001 and $675,137 respectively, were expended in these areas from GR&S Appropriation funds. In fiscal year 1959, BSS provided $590,000 for air pollution and $147,500 for water pollution, while DGMS provided $434,870 and $972,037 in these areas respectively. Under arrangements made several years ago, the expenditure of the BSS funds has been through the NIH review and granting mechanism. The administration of the grants was handled by the NIH Division of Research Grants through FY 1958 and by DGMS since then. For fiscal year 1960, BSS had provided $450,000 for research grants in air pollution and DGMS $724,576 as of January 1960. In FY 1960 BSS provided no funds for water pollution, while DGMS, as of January 1960, had expended $1,141,298 in water pollution grants.

In April 1959 the House Appropriations Committee called upon PHS to carry out a study on environmental health problems and on the most efficient organization of facilities to meet these problems.

In connection with this study, the Research Grants Branch and the Chief, DGMS, have provided full cooperation and assistance to Dr. William Stewart, who was named to head a Task Force on Environmental Health. DGMS has conferred with BSS on the study and has worked closely with the Special Committee on Environmental Health Problems and Facilities of the National Advisory Health Council.

In addition, the Research Grants Branch provided an extensive orientation over a five-month period in research grant management procedures for Mr. Donald Green of the BSS Division of Special Health Services.

Clinical Research Facilities

The NIH responsibility for developing a program for Clinical Research Facilities was assigned to this Division in the fall of 1959.

The program resulted from directions in the June 1959 Senate Appropriations Committee Report; and the Congress provided $3,000,000 for the establishment of a number of "therapeutic and metabolic" research units in different locations of the country. The $3,000,000 represents $500,000 from the appropriations of each of the Institutes with the exception of the National Institute for Dental Research.

The program is administered by the Research Grants Branch of DGMS, with Dr. L. Edgar Lee as acting chief of an ad hoc section on Clinical Research Facilities. Dr. G. Donald Whedon has been assigned as a special assistant to the Chief, DGMS, with specific responsibility for carrying out the field work in the development of the program.

A six-man committee of the National Advisory Health Council was appointed to advise on the Facilities, consisting of H. Stanley Bennett, M.D., University of Washington School of Medicine; Sidney Farber, M.D., Harvard Medical School; Philip Handler, Ph.D., Duke University School of Medicine; George T. Harrell, M.D., University of Florida School of Medicine; I. S. Ravdin, M.D., University of Pennsylvania School of Medicine; and Francis O. Schmitt, Ph.D., Massachusetts Institute of Technology.

Named as Special Advisors to this Committee were the following: Michael E. DeBakey, M.D., Baylor University College of Medicine; E. Henry Keutmann, M.D., University of Rochester School of Medicine and Dentistry; Harold W. Krogh, D.D.S., Washington Hospital Center, Washington, D. C.; H. Houston Merritt, M.D., Columbia University College of Physicians and Surgeons; Carl V. Moore, M.D., Washington University School of Medicine; Albert W. Snoke, M.D., Yale University School of Medicine; Lewis Thomas, M.D., New York University College of Medicine; and John C. Whitehorn, M.D., Johns Hopkins University School of Medicine.

As of the end of January 1960, applications from 19 research institutions had been received in response to a November 1959 letter

from Dr. Whedon to medical schools and other research institutions. Dr. Whedon, alone or accompanied by Dr. Frederick L. Stone or Dr. Lee, has visited 16 of these institutions and project site visits to these 16 institutions by members of the National Advisory Health Council Committee are scheduled in February in preparation for the February 23 meeting of the Committee to consider the applications. The National Advisory Health Council will take action on the applications at its March meeting. The processing of additional applications is under way in preparation for the June National Advisory Health Council meeting.

RESEARCH TRAINING GRANTS

In reflection of the growth of the DGMS budget for research training grants from $2,960,923 in fiscal year 1958 to $13,040,000 in fiscal year 1960, the program has increased from two programs in July 1958, Biometry and Epidemiology, to a total of ten as of December 31, 1959. Six were established the latter part of calendar year 1958. These were Anatomical Sciences, Biochemistry, Genetics, Pathology, Pharmacology and Physiology. During calendar year 1959 two additional programs have been established, in Embryology and Development and in Microbiology. Functioning under DGMS are ten Training Committees, made up of non-Federal experts, to provide guidance on the programs, review the grant applications and make appropriate recommendations to the National Advisory Health Council.

As of December 31, 1959, the Division was supporting 286 research training grants in these and related programs in different institutions across the country. Of this total 108 were new grants, made in fiscal year 1960, and 178 were continuations. As of December 31, 1959, $11,850,210 had been expended or committed from FY 1960 appropriations, of which $7,939,873 was for continuations and $3,910,337 for new grants.

The following figures show the percentage distribution of DGMS research training funds by discipline:

Discipline	Percentage of total program*
Anatomical Sciences	6.5%
Biochemistry	17.2
Biometry	7.5
Epidemiology	8.0
Embryology and Development	6.8
Genetics	8.6
Microbiology	7.5
Multidisciplinary	6.0
Nutrition	0.7
Pathology	13.3
Pharmacology	10.6
Physiology	6.2
Other	1.1
TOTAL	100.00%

*Excludes Experimental Training Grants

Experimental Training Grants

The most significant development in this program during calendar year 1959 was the approval by the November National Advisory Health Council meeting of a grant to Dr. John Cowles of the University of Pittsburgh to carry out an evaluation of the Experimental Training Grants Program. Because of particular interest in the program a copy of the Special Report to Congress on ETG is attached as Appendix A.

Research Fellowships

This program, which has grown from $1,997,470 in fiscal year 1958 to $5,310,000 in FY 1960, continues under dual management by DGMS and the Division of Research Grants.

The funds, provided under the General Research and Services appropriation, are defended by DGMS in the appropriations hearings and are included in the DGMS program.

In the case of the Senior Research Fellowships, this Division has full administrative responsibility for the program.

In the case of the other fellowship programs, including the Regular, Postsophomore, Foreign and Part-time, the administrative responsibility is shared by DGMS and DRG.

Senior Research Fellowships -- As of the end of calendar year 1959, this program had made (five-year) awards to 195 individuals in 60 schools in 33 States and the District of Columbia, as follows:

FY 1957	FY 1958	FY 1959	FY 1960	Total
44	43	87	21	195

It is anticipated there will be at least 46 additional awards in fiscal year 1960 for an estimated total as of June 30, 1960 of 241.

In addition to preclinical fields such as anatomy, behavioral sciences, biochemistry, biophysics, biostatistics, genetics, microbiology, pathology, pharmacology, and physiology, this program accepts applications also from clinical departments in genetics and behavioral sciences in recognition of the extreme shortage of research-trained manpower in these fields.

At the November 1959 meeting, the National Advisory Health Council approved a recommendation of the Senior Research Fellowship Selection Committee that applications submitted by clinical departments in areas other than genetics and behavioral sciences be reviewed under the following conditions:

1. The research and career development plans of the candidate fellow and the sponsoring department are of a fundamental or basically oriented nature indicating the applicant's desire and the department's willingness to undertake a program which will fit the applicant for a productive career in a clinical department.

2. The academic background and professional training of the candidate are such as to give promise that the candidate will be able to advance up the academic ladder in the sponsoring clinical department or in another similar department.

While it is expected that a few applications for the support of scientists from clinical departments will be received during 1960 it is unlikely that any such fellowships will be awarded until fiscal year 1961.

The budget for Senior Research Fellowships was $2,000,000 in FY 1959 and $3,000,000 for FY 1960.

Other Fellowship Programs -- Aside from the more specific purposes of Senior Fellowships, these programs serve to give students in schools of medicine, dentistry, nursing and public health an orientation to, and an appreciation of, basic research; to allow foreign scientists to participate in the research opportunities in this country, and to provide firm, long range fellowship support for young staff members with a primary interest in research.

The 1959 and 1960 program plan provides for support at various levels as set forth below:

Type of Fellowship	1959		1960 Estimate	
	No.	Amount	No.	Amount
Regular	55	$263,745	239	$1,035,000
Postsophomore	126	435,910	151	575,000
Foreign	50	344,850	57	400,000
Senior	165	2,000,000	241	3,000,000
Part-time student	332	215,135	463	300,000
Total	728	$3,259,640	1,151	$5,310,000

CENTER FOR AGING RESEARCH

The Center for Aging Research, which was established in 1956 and became a component of DGMS in July 1958, is charged with stimulating and coordinating research and training in gerontology both through grants and through direct research in this field by all the Institutes.

During the past year, national interest in research in aging has mounted at a rate noticeably above that of prior years. The increase in NIH expenditures in extramural research related directly and indirectly to aging may amount to more than 90 percent over January 1959, in a total figure possibly exceeding $14,000,000.*

Activities of CAR

The identification of gap areas in the field of gerontology remains foremost in the activities of the Center for Aging Research. Assistance in this effort is provided by the NIH advisory groups,

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*As of February 1, 1960, the deadline for this report, these final figures were not available because of delays by the Institutes in making awards following the November meetings of the National Advisory Councils. Final figures are expected about February 8 for the Special Report on Aging, for Congress, a copy of which will be sent to OD, NIH.

individual researchers, national organizations and other groups and individuals. As new gap areas appear, and other areas begin to receive increased attention, programming emphasis is shifted accordingly.

Investigators are being urged to develop and test specific hypotheses in regard to determining the mechanisms which underlie the process of aging. A prime requirement in gerontology today is the development of a 'body of theory' resulting from verified imaginative hypotheses.

Interdisciplinary University-Centered Research Centers on Aging

CAR is continuing to provide assistance to university and medical school groups which wish to develop collaborative research programs in a manner similar to those at Duke and Albert Einstein.

In this regard in the past year visits were made to the following: Western Reserve University, University of Minnesota, University of Texas Medical Branch, University of California, University of Miami, Stanford University, State University of Iowa, University of Florida, University of Wisconsin, and Washington University, St. Louis.

Selected examples of other places and persons visited in connection with various interests in research in aging include: Eye Institute, Columbia University, College of Physicians and Surgeons, New York, New York; Department of Physical Medicine and Rehabilitation, New York Medical College, New York, New York; Department of Biochemistry, Boston University School of Medicine, Boston, Massachusetts; Pinellas County Health Department, St. Petersburg, Florida; Department of Genetics, Iowa State College, Ames, Iowa; Department of Preventive Medicine and Public Health, University of Oklahoma Medical Center, Oklahoma City, Oklahoma, and the City-County Health Department, Tulsa, Oklahoma; Department of Sociology and Anthropology, Ohio State University, Columbus, Ohio; Lankenau Hospital, Philadelphia, Pennsylvania; Menorah Home, Brooklyn, New York; Harvard School of Public Health, Boston, Massachusetts; and Bowman Grey School of Medicine, Winston-Salem, North Carolina.

Publications

Various publications prepared by, or assisted in, by CAR during the past year include:

"Research Grant Program of NIH with Special Emphasis on Research in Aging," by Drs. Hunt, Akers and Mohler, in the June 1959 issue of Geriatrics.

The 121-page booklet, Activities of the National Institutes of Health in the Field of Gerontology, January 1959, published as PHS Publication No. 695.

The 50-page booklet, *AGING, A Review of Research and Training Grants Supported by the National Institutes of Health, December 1958*, published as PHS Publication No. 652.

The demand for both of these two latter publications has remained very high.

At the suggestion of the Committee on Aging of the NAHC, a report on research in aging conducted within the United States since 1946 is being prepared by CAR. It will describe the sources of support, as well as the areas supported.

A brief summary of research in aging at NIH was prepared especially for the Maryland Conference on Aging held at the Clinical Center, January 20, 1960.

Cooperation with Other Agencies

Following is a partial list of the organizations with which the Center for Aging Research maintains more or less regular communication, and, on occasion, participates in joint project site visits:

Gerontology Branch, National Heart Institute; Section on Aging, National Institute of Mental Health; Special Staff on Aging, Office of the Secretary; Health of the Aged Section, Chronic Disease Program, Bureau of State Services; Division of General Health Services, Bureau of State Services; Public Health Service Committee on Aging; Federal Council on Aging; the Atomic Energy Commission; the Veterans Administration; and General Services Administration.

In the case of the White House Conference on Aging, CAR is providing technical assistance to the committees where appropriate and serving as the NIH focal point for inquiries concerning NIH consultants to the Conference.

Meetings and Conferences

DGHS provided a grant of $5,656, approved by the June 1959 National Advisory Health Council, to support a two-day symposium on aging during the 1959 meeting of the American Association for the Advancement of Science in Chicago. The symposium, held in December, was an outstanding success.

Application has been made for a grant to support the Fifth International Congress of the Gerontological Society in San Francisco in August 1960.

The staff of the Center for Aging Research attended a portion of the Second Summer Institute in Social Gerontology held during August of 1959 in Berkeley, California.

The CAR staff attended various meetings of the Joint Council to Improve the Health Care of the Aged (American Dental Association, American Hospital Association, American Medical Association, and the American Nursing Home Association). Consultation was provided for investigators at the 1959 spring meetings of the Federation of American Societies for Experimental Biology and Medicine in Atlantic City and the American Medical Association meeting which followed shortly thereafter in the same location.

A meeting was held with the medical directors of the leading airlines concerning the aging of pilots.

Personnel & Facilities

At the end of the year the position of Director of CAR remained vacant, with G. Halsey Hunt, M.D., Chief, DGMS, fulfilling this function.

An addition to the CAR staff during the year was Elizabeth G. Frame, Ph.D., biochemist, who transferred from the Clinical Center where she was Chief of the Biochemistry Service.

During the year the Center was moved from Stone House to Building T-18.

NATIONAL ADVISORY HEALTH COUNCIL

During the year Drs. Walsh McDermott and Donald Pillsbury and Mrs. Mary Rockefeller left the National Advisory Health Council, being replaced by Mr. Russell R. Larmon, Dr. Isadore S. Ravdin and Dr. Francis O. Schmitt. Other members of the Council are: Dr. H. Stanley Bennett, Dr. Sidney Farber, Dr. Harold Gotaas, Dr. Philip Handler, Dr. George T. Harrell, Mr. Boisfeuillet Jones, Dr. Malcolm H. Merrill, Mr. Edmund Fitzgerald and Mr. Theodore Berenson.

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To be considered as Supplement
to DGMS Annual Report.

SPECIAL REPORT:
RESEARCH ON AGING

Research in the field of aging continued during the past year as an area of special NIH activity reflecting rapidly mounting national and international interest in gerontology and increasing concern for the wellbeing of the aged population.

In addition to the continuing research programs carried out by NIH scientists, grants by NIH to medical schools and other private institutions for research in aging have increased 62 percent in expenditures over 1959.

The investigations conducted or supported by NIH covered many aspects of aging in these three broad areas: (1) the biological process of aging; (2) the chronic diseases commonly associated with the aged; and (3) additional health-related problems of the aged, such as the mental health difficulties growing out of changing cultural demands.

INTRAMURAL ACTIVITIES

Since the study of aging is, in effect, a study of the whole phenomenon of life at various stages and since it can be very closely related to the study of disease, a great part of all the intramural research carried out by the Institutes of NIH is significant in the investigations of the aging process and in studies of the health problems of the aged. Chronic disorders such as heart disease, cancer, arthritis, blindness, mental illness and metabolic and dental diseases, which are the concerns of the different Institutes, all affect the aged population in varying degrees, as well as the infectious diseases which also are the subject of constant NIH study. Progress in these fields, therefore, is of frequent and direct benefit to the older population.

In addition, there are two regular intramural NIH programs devoted specifically to research in aging. These are the Section on Aging, of the National Institute of Mental Health, and the Gerontology Branch, of the National Heart Institute.

Prepared February 1960 as background information for the Chief of the Division of General Medical Sciences, National Institutes of Health, Public Health Service, U. S. Department of Health, Education, and Welfare, in connection with fiscal year 1961 appropriations hearings.

Section on Aging, National Institute of Mental Health

This unit, established in 1953, is composed of psychologists, physiologists and chemists studying the behavioral changes which accompany aging. Under the direction of Dr. James E. Birren, the staff of the Section is observing the aging process in animals and humans in order to reveal and understand the interaction of physical and mental aging processes.

Examples of their research projects include studies of the adaptability and psychomotor changes resulting from chronological age; changes in sensation, perception and response; and analyses of differences in speed, accuracy and association habits in mental and psychomotor actions.

During the past year the Section on Aging assisted in the preparation of a Handbook of Aging and the Individual: Psychological and Biological Aspects, which is a summary of the scientific and professional literature on the psychological and social aspects of human aging. Dr. Birren served as editor. The book's four sections are entitled "Foundations of Research on Aging;" "Biological Bases of Aging;" "Aging and Environmental Settings;" and "Psychological Characteristics of Aging." The 24 chapters of the book were written by recognized authorities across the Nation.

Also during the past year the Section on Aging finished editing a monograph on aging based on coordinated work by a variety of scientists from different disciplines of the National Institute of Mental Health. The monograph, entitled Human Aging: Biological and Behavioral Aspects, presents findings from studies of older men from physiological, psychiatric, psychological and social standpoints. The studies compare differences between two age groups.

At the conclusion of this report (Appendix A) is a complete list of professional articles and other written materials which were published by the Section during 1959.

The fiscal year 1960 budget for the Section on Aging was $174,000.

Gerontology Branch, National Heart Institute

This unit, which was established in 1941 and thus is one of the oldest in the field of aging in the United States, is

conducting a broad range of studies in five principal areas: (1) biological and cellular physiology of aging; (2) human physiology; (3) human work performance; (4) human psychological performance; and (5) geriatrics.

Under the direction of Dr. Nathan W. Shock, the Branch is carrying out research ranging from studies of primitive forms of life to long-term studies on human beings of various age levels. Working with Dr. Shock are histologists, physiologists, biochemists, psychologists, biophysicists, embryologists, zoologists and chemists.

The program of the Branch is set up under two principal headings: Basic Biology, including the Sections on Comparative and Cellular Physiology, Nutritional Biochemistry, Intermediary Metabolism, Morphology, Biophysics, and Molecular Biology; and Human Physiology and Clinical Medicine, including the Sections on Cardiovascular-renal Physiology, Metabolism and Endocrinology, Human Performance, Clinical Medicine, Psychological Aspects of Aging, Physiological Psychology, Mental Performance and Personality.

In the research headed Longitudinal Studies, the Branch is carrying out extensive tests on a group of 250 men ranging in age from 32 to 99 years. The subjects, most of them in the upper socio-economic levels, have agreed to spend two days in the Baltimore City Hospitals for examinations every 18 months for a period of at least 10 years. The program permits the scientists of the Branch to make detailed observations on the psychological and physiological effects of the aging process in these men, and permits comparisons with previously compiled findings on groups of subjects from lower socio-economic levels.

In connection with its other programs, the Branch is cooperating with the Baltimore City Hospitals and the Johns Hopkins Medical School in the establishment of a training program in geriatrics. Under the plan, improved instruction would be provided, primarily for medical students and physicians, in the specialties which are becoming better identified with the medical requirements of older patients.

During the coming year the Branch plans to strengthen its research work in human physiology with the recruitment of established clinical investigators with interests in cardiovascular and endocrine problems.

At the conclusion of this report (Appendix B) is a complete list of articles and other written materials which were published by the Branch during the past year.

The fiscal year 1960 budget for the Branch was $620,000, which provides salaries for all the investigators and laboratory operating expenditures. Support by the Baltimore City Hospitals for the program includes 30,000 square feet of laboratory space, including all utilities, a 50-bed research ward with all facilities for patient care; and access for study to all patients in the 1500-bed hospital and 1000-bed Old People's Home.

EXTRAMURAL ACTIVITIES

To a greater or lesser degree, research in aging always has been included in the extramural grant programs of NIH since these programs were begun in 1946. Over the years many different scientific investigators have undertaken NIH-supported projects related directly or indirectly to different aspects of aging.

It was not until 1956, however, when it was decided that the field of gerontology required and justified much greater emphasis, that NIH began identifying and classifying these projects as investigations in aging.

Center for Aging Research

At that time the NIH Center for Aging Research was established and assigned the specific responsibility of working with the Institutes in fostering research in all aspects of aging. The Center, which is a branch of the Division of General Medical Sciences, stimulates and assists the development of new research projects in gerontology at the universities, medical centers and various other research institutions in this country, and, to a lesser extent, abroad. The Center provides liaison between NIH intramural and extramural activities in aging, and close cooperation with other bureaus and divisions of the Department of Health, Education, and Welfare, including the Special Staff on Aging in the Office of the Secretary; the Health of the Aged Section in the Chronic Disease Program of the Bureau of State Services; and the Public Health Service Committee on Aging. The Center is working with the Atomic Energy Commission in supporting studies of the similarities between radiation effects and physiologic aging.

Full cooperation is being given to the Federal Council on Aging and to the White House Conference on Aging. In the latter instance, the CAR staff is providing technical assistance

in planning the agenda of the Conference. The Center also continues to cooperate with the great number of private organizations in the field of aging.

As a result of this increased emphasis on aging, the NIH extramural grant programs in gerontology have grown from $1,304,091 in 1957 to $4,570,424 in 1958 and to $7,757,111 in 1959. For the current year expenditures are expected to total $12,443,368.

During the past year there were 172 additional awards for research projects in aging, bringing the total number of current projects to 582.

At the conclusion of this section are three tables covering the growth of the grant programs in aging, reflecting the activity of each Institute and the Division of General Medical Sciences, since 1957.

Interdisciplinary Research Centers

Upon the recommendations of the National Advisory Councils, two large-scale interdisciplinary research projects have been established with NIH support, one at Duke University, Durham, North Carolina, in 1957, and the other at the Albert Einstein College of Medicine, New York, in 1958. These large projects are aimed at permitting scientists representing different facets of research to integrate and coordinate their efforts so that the work of each can achieve greater scope and depth in scientific findings.

The Duke project is university-wide in scope, involving a number of departments other than the medical school. The Albert Einstein program is concentrated in the medical school where intense attention can be given to patients in the Nathan Van Etten Hospital. The City of New York has made a large ward there available to the program and is providing the basic medical care needed by the research patients. The Albert Einstein project is seeking a high level of flexibility in its investigations, with particular emphasis on the effort to cut across the dividing lines of disciplines and departments.

In the past year noteworthy progress has been achieved at both centers. Twenty separate research projects have been initiated under the Duke program and research papers on a wide range of aging problems have been contributed by the Duke

scientists to the professional literature. In November 1959, the Duke Center for the Study of Aging sponsored its First Annual Conference on Gerontology.

In the Albert Einstein program, a year younger than Duke, work has been completed in the renovation of research laboratory space and has moved from the "tooling-up" to "tuning-up" phase. A number of patients at the Nathan Van Etten Hospital already are under study.

The Duke program is supported by grants from the National Heart Institute and the National Institute of Mental Health. The Albert Einstein project is supported by these two Institutes plus the National Institute of Arthritis and Metabolic Diseases.

Other extramural research activities of the Institutes in gerontology are summarized in the following brief discussions.

Division of General Medical Sciences

In its responsibility for supporting research and research training in the sciences basic to medicine and biology, and in public and environmental health and medical care, the Division of General Medical Sciences is carrying out a program primarily aimed at developing more information on the basic biological nature of the aging process, in the cells and tissues of the body, in organs such as the liver, and as related to enzymes and hormones. The work includes investigations into the importance of genetics in the character of the aging process and in longevity. Studies on the influences of nutrition and on the effects of man's living and working environment also are being supported, along with investigations into better rehabilitation techniques for older persons. At present, DGMS is supporting a total of 29 projects related primarily to aging.

National Heart Institute

Traditionally, the National Heart Institute has been a leader in developing and sponsoring programs of research in aging. This interest rests upon the fact that age changes in the heart and blood vessels alter the functional capacity of the organism, and conversely, age changes in other parts of the organism have a marked influence upon cardiovascular function.

The National Heart Institute has a deep interest in the large interdisciplinary research centers on aging previously described in this report. In conjunction with other components at NIH, this Institute is supporting certain research conferences on aging, which are attended by many foreign, as well as American, gerontologists. Research conferences which focus attention on the inter-relationships between long-term exposure to low levels of radiation, and subsequent biological changes which appear similar to the changes which accompany aging, are supported by the National Heart Institute. These conferences have been conducted under the auspices of the American Institute of Biological Sciences and are jointly supported by the National Heart Institute and the Atomic Energy Commission.

Eighty research and training projects supported by grants from the National Heart Institute are classified as bearing directly on aging. These projects range from studies of coronary artery disease, through studies on hypertension, to comparative studies of cardiovascular disease in animals of different species.

National Cancer Institute

Cancer itself is not an integral part of the biologic process of aging, though it is possible that the aging process lowers the threshold for the development of certain types of cancer. As a general statement, aged persons, by virtue of having been exposed for longer periods to agents which predispose to cancer, are more likely to develop cancer than younger individuals.

Currently, the National Cancer Institute is supporting twenty-one projects classified as bearing directly on aging. Since over half of all cancers occur in people over 50 years of age, and since the number of persons in this advanced age group is increasing rapidly, these studies on cancer and aging are assuming increasing significance. The projects concern hormonal effects, radiation effects and other factors important to the field of cancer.

National Institute of Allergy and Infectious Diseases

This Institute is supporting a number of studies which are attempting to determine the interplay between age of the host and his susceptibility to infection. At the present time four extramural studies are concerned primarily with problems in the field of aging.

National Institute of Arthritis and Metabolic Diseases

At present, 47 projects supported by this Institute relate directly to the processes and problems of aging. A critical problem very common to the aged is osteoporosis, or fragile bones. A number of studies supported by this Institute are concerned with this problem. Several studies also focus on hormone changes, particularly the sex hormones, and the general changes which accompany menopause. Other studies are attempting to determine the role of connective tissue in the aging process.

This Institute is providing part of the support for the large interdisciplinary research center on aging which is located at the Albert Einstein College of Medicine.

National Institute of Dental Research

Good functional integrity of the teeth and jaws is important in maintaining adequate nutritional status in the aged. Twenty-two studies supported by this Institute pertain to this problem and related problems.

Three-fourths of the loss of teeth suffered by individuals beyond 35 years of age is due to gradual degeneration of the tissues which support the teeth. Several projects are aimed at learning more about why these supporting tissues so often deteriorate in middle-aged and aged individuals.

Several studies relate to the design of prosthetics for replacement of lost teeth in the aged. On a more basic level, this Institute is supporting studies which focus on the biochemical changes in tooth structure occurring with age. Of particular interest are calcium and fluoride changes with age.

National Institute of Mental Health

Forty extramural projects supported by this Institute pertain directly to aging. One purpose of the work is to help determine what factors are essential to mental wellbeing of the aging and the aged. For example, the adjustments in living which follow vocational retirement have a significant impact on the individual. Also, the problems which relate to three generations living within one household are yet to be fully understood.

This Institute is supporting certain research conferences on problems of mental health from the standpoints of both the individual and the community. Some of the conference support is concerned with bringing gerontologists together who are working in all parts of the world on problems of mental health and the aged.

National Institute of Neurological Diseases and Blindness

Thirty extramural and several intramural projects are supported by this Institute which relate directly to aging. Of prime interest are studies on changes in nerve cell and tissue function with age, particularly reflex action, cataracts, glaucoma, deafness, and strokes.

These studies have a special bearing on problems of aging and the state of being aged, since the nerve tissues and sensory structures of higher organisms play a controlling role in determining activity.

The following tables show the number and annual value of research and training grants in aging that were active on January 31, 1960. The fiscal year columns indicate the appropriation from which funds were derived to support these projects. These tables essentially reflect calendar year activity. The date of January 31 was chosen in order to give full effect to the actions of the November meetings of the National Advisory Councils.

NIH RESEARCH AND TRAINING GRANTS IN AGING
ACTIVE AS OF JANUARY 31, 1960

Primarily Related to Aging

Institute	Number	FY 1958	FY 1959	FY 1960	Total
General*	28		$ 393,851	$ 715,276	$1,109,127
NCI	19		82,449	279,697	362,146
NHI	72		316,365	1,400,322	1,716,687
NIAID	4		11,215	18,363	29,578
NIAMD	42		66,659	567,432	634,091
NIDR	19	$14,384	119,919	88,502	222,805
NIMH	31	72,678	485,141	461,129	1,018,948
NINDB	29		131,018	336,498	467,516
TOTAL	244	$87,062	$1,606,617	$3,867,219	$5,560,898

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Secondarily Related to Aging

Institute	Number	FY 1958	FY 1959	FY 1960	Total
General*	40		$ 171,519	$ 523,515	$ 695,034
NCI	38		211,577	469,738	681,315
NHI	117		907,711	1,792,053	2,699,764
NIAID	21	$18,384	42,811	192,825	254,020
NIAMD	49	11,129	104,670	888,129	1,003,928
NIDR	24	8,012	156,697	316,609	481,318
NIMH	20		190,189	228,416	418,605
NINDB	29		138,977	509,509	648,486
TOTAL	338	$37,525	$1,924,151	$4,920,794	$6,882,470

* DGMS

NIH RESEARCH AND TRAINING GRANTS IN AGING
ACTIVE AS OF JANUARY 31, 1959

Primarily Related to Aging

Institute	Number	FY 1958	FY 1959	Total
General*	15	$ 18,192	$ 532,231	$ 550,423
NCI	20	120,021	424,407	544,428
NHI	60	227,888	1,034,709	1,262,597
NIAID	3	20,350	10,010	30,360
NIAMD	35	37,148	453,958	491,106
NIDR	11	38,785	60,774	99,559
NIMH	32	340,344	514,716	855,060
NINDB	21	109,706	190,741	300,447
TOTAL	197	$912,434	$3,221,546	$4,133,980

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Secondarily Related to Aging

Institute	Number	FY 1958	FY 1959	Total
General*	14	$ 32,000	$ 268,910	$ 300,910
NCI	31	180,556	263,353	443,909
NHI	84	441,079	1,192,186	1,633,265
NIAID	10	24,833	81,558	106,391
NIAMD	32	50,344	528,042	578,386
NIDR	19	148,867	152,760	301,627
NIMH	6	43,499	53,397	96,896
NINDB	11	17,239	144,508	161,747
TOTAL	207	$938,417	$2,684,714	$3,623,131

* DGMS

NIH RESEARCH AND TRAINING GRANTS IN AGING
ACTIVE AS OF JANUARY 31, 1958

Primarily Related to Aging

Institute	Number	FY 1955	FY 1957	FY 1958	Total
General*	9		$ 12,258	$ 249,419	$ 261,677
NCI	11		40,853	99,991	140,844
NHI	48		138,700	747,329	886,029
NIAID	None				
NIAMD	14		41,179	132,434	173,613
NIDR	7		29,821	30,122	59,943
NIMH	28	$23,686	162,972	440,641	627,299
NINDB	14		37,751	79,215	116,966
TOTAL	131	$23,686	$463,534	$1,779,151	$2,266,371

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Secondarily Related to Aging

Institute	Number	FY 1955	FY 1957	FY 1958	Total
General*	5		$122,262	$ 81,951	$ 204,213
NCI	20		90,207	141,437	231,644
NHI	60		349,597	703,682	1,053,279
NIAID	7		2,501	60,574	63,075
NIAMD	21		82,181	192,470	274,651
NIDR	16		121,426	143,872	265,298
NIMH	6		38,298	35,706	74,004
NINDB	8		34,085	83,804	117,889
TOTAL	143		$840,557	$1,443,496	$2,284,053

* DRG

NIH RESEARCH AND TRAINING GRANTS IN AGING
ACTIVE AS OF JANUARY 31, 1958

Primarily Related to Aging

Institute	Number	FY 1955	FY 1957	FY 1958	Total
General*	9		$ 12,258	$ 249,419	$ 261,677
NCI	11		40,853	99,991	140,844
NHI	48		138,700	747,329	886,029
NIAID	None				
NIAMD	14		41,179	132,434	173,613
NIDR	7		29,821	30,122	59,943
NIMH	28	$23,686	162,972	440,641	627,299
NINDB	14		37,751	79,215	116,966
TOTAL	131	$23,686	$463,534	$1,779,151	$2,266,371

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Secondarily Related to Aging

Institute	Number	FY 1955	FY 1957	FY 1958	Total
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TOTAL	143		$840,557	$1,443,496	$2,284,053

* DRG

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Annual Report of Activities
Division of Research Grants
Calendar Year 1959

Summary Statement of Extramural Program

Throughout calendar year 1959, the Division of Research Grants functioned as the center for administering the grants and awards programs of the National Institutes of Health. In terms of projects and funds awarded from the fiscal year 1959 budget, the Division provided full processing, review, and fiscal services for a program that resulted in the award of 9,166 research project grants totaling $142.6 million; 2,811 fellowships, $10.1 million; and 211 health research facility construction grants totaling $32 million. (This latter program is a DRG responsibility.) The Division also provided fiscal audit services for 495 traineeship awards, totaling $2.5 million, and 1,956 training grants amounting to $49.2 million.

Additionally, the Division continued to conduct the International Fellowships Program for postdoctoral research training in the U. S. for promising foreign scientists, and a Visiting Scientist Program which permits U. S. and foreign scientists with special qualifications to work in foreign research centers and in NIH laboratories.

During November 1959, responsibility for the NIH Russian Translation Program was transferred to the Division of Research Grants.

In order to fulfill its responsibilities within the total extramural program area, a number of programs were expanded, policy changes were made, reorganizations were effected, and some new members were added, including the establishment and staffing of the position of Executive Officer. The activities within the various branches and study sections are summarized here.

Information Office

Established in the Office of the Chief, DRG, the Information Office is responsible for planning, developing, directing, and executing a broad program to provide both special and across-the-board information on the policies, programs, activities and accomplishments, and the technical and administrative aspects of the NIH extramural programs for research, training, and construction.

In line with the continually expanding extramural programs with an attendant rise in the volume of requests for information services, the Information Office added an Information Specialist to the existing staff of Information Officer, Information Specialist, and secretary. The office expanded a number of existing programs, and added new programs, such as a bi-weekly administrative publication; the introduction of visuals (slides, exhibits, posters, etc.); establishment of a current CV file with photos of key DRG personnel; preparation of Fact Sheets on various programs; an informational training program, and others.

The office continued in its responsibilities for preparing annual and special reports for the Congress; writing and distributing press releases; preparing weekly reports on program developments; handling voluminous public inquiries by telephone and correspondence; providing editorial assistance as required; handling clearances of manuscripts; etc.

Research Grants Review Branch

The continuing upward trend in the volume of research grant applications necessitated, in March 1959, a DRG reorganization that provided an expanded and strengthened mechanism for the review and assignment of research grant applications.

As reorganized, the Chief, Research Grants Review Branch, serves also as the Chief Project Review Officer responsible for reviewing all research grant applications and assigning such applications to the appropriate Institute and Study Section. The existing 35 study sections are divided into three research groups: clinical; biochemical and physical sciences; and health services research. Each research group is headed by a scientist-administrator who, in addition to coordinating the activities of his assigned study sections, assists in initial review and assignment of applications falling within the province of his group. The group administrator functions, therefore, as an Assistant Branch Chief and as Assistant Project Review Officer.

The new administrative structure enabled the Research Grants Review Branch to continue to expedite the increasing volume of research grant applications while simultaneously maintaining the high quality of review of the applications. Additionally, the reorganization served to streamline staff communications, and to facilitate the training and guidance of newly appointed executive secretaries to the study sections.

By the end of 1959, four new study sections had been established, bringing the total of such sections to thirty-five. In accordance with the Presidential criteria incorporated in the signing of the fiscal year 1960 appropriations bill, the study sections continued to maintain their high standards of critical review of research grant applications. It is the consensus of opinion among these sections that the quality selection of investigators seeking support for the first time has been maintained in spite of sharp increases in the number of applicants, whereas the quality of research effort among investigators supported on a renewal basis has improved through study section insistence upon research results. Investigations failing to meet these standards have been recommended for disapproval in ever-increasing numbers.

Throughout the year, the Division continued to examine all aspects of its modus operandi in order to maintain the highest standard of efficiency in the review and appraisal of applications.

Interdisciplinary Research

Applications involving interdisciplinary research continue as an area of special interest in the Division's review and appraisal mechanism, particularly since single disciplines are in many cases inadequate to meet the research needs of today. Applications for interdisciplinary research support exceeded similar applications received during 1958, and are expected to rise in volume during the coming year. A part of the increased average cost of research grants during 1959 is due to this pooling of talents which, in many cases, was necessary to the successful completion of complex projects.

Grants Management Branch

In previous years, it has been possible to keep basically current on the audit of grants. During 1959, the audit program lagged somewhat, since the increased fiscal appropriations and resultant program expenditures were not matched by a proportionate increase in staffing for the DRG auditing unit. As a consequence, a backlog developed in the program.

Changes in Policy, Procedures

A number of changes in policy and procedures increased the Branch workload, particularly in the area of liaison and contacts with grantee institutions. Among these changes were new procedures for grants payments, and in the use of grant funds for travel expenses.

Previous policy for grants payments provided that one payment covered all grants under $5,000, while grants in excess of $5,000 were made in two separate payments. During March 1959, this procedure was revised to provide for one full payment of all grants of $10,000 or less, and one-half payment on grants in excess of $10,000 with the second payment being made automatically at approximately the sixth month.

A new policy was also established for payments to grantee institutions. It provided that each grantee institution would receive one check each month. This check covered all of the grant payments (including research, training, and construction) due within the month. Attached to the check, a list detailed each grant number and the amount of money being paid on each grant.

Thirdly, the Division revised the policy concerning the use of grant funds for travel expenses. The grantee institution and the principal investigator were made responsible for determining whether or not such travel was appropriate and necessary to a research project, thereby eliminating the necessity of receiving prior approval for such travel from the Public Health Service.

Reevaluation Scheduled

In view of the expanding program, the Branch plans to begin a reevaluation of the organization and functions of the Audit Section. This is a necessity, if the audit program is to regain its footing on a current basis and is to eliminate the possibility of developing future backlogs.

Personnel

A major problem during 1959 was the loss of key personnel to other Federal agencies. This loss is attributable to the grade structure allocated to this Branch.

Health Research Facilities Branch

Now in its fourth year of operation, the grants program for the construction of health research facilities continued as a responsibility of the Division of Research Grants.

During 1959, grants totaling $30 million were made to 124 institutions in 36 States and the District of Columbia. Within the same 12 months, however, 154 original applications and 41 supplemental requests were received, and in December the program's administrators had on hand 96 notices of intention to file, and an additional 20 supplemental requests to be reviewed by the National Advisory Council on Health Research Facilities. These two latter groups represent requests totaling more than $50 millions.

In the area of construction progress, 147 projects were completed and put into use during 1959. These facilities represent the expenditure of $15,983,118 in Federal funds and total construction costs of more than $81 million. At the year's end, some 180 additional projects were under contract.

From the program's inception to the present time--fiscal years 1957 through 1960--appropriations of $120 millions have been allocated by the Congress for the construction of such facilities.

Statistics and Analysis Branch

The Division's Statistics and Analysis Branch conducts a statistical research and evaluation program which provides to NIH administrators, other Government agencies, and the Congress, information on the status, progress, and direction of every phase of extramural activities at the National Institutes of Health.

During 1959, its first full year as an operational unit, the Statistics and Analysis Branch planned and established a number of programs such as those for information indexing, storage, retrieval, and summary; classification of medical information; redesign and mechanization of statistical processing procedures within the Division of Research Grants; and for establishing a uniform system of securing information on Fellows or trainees at NIH and within grantee institutions.

Two components were established within the Branch: the Program Analysis Unit, and the Design and Analysis Section. The former is responsible for appraising the effects of NIH support on research and for making program recommendations. The latter provides assistance in the design of information systems and resolves technical problems concerning collecting and retrieving information.

A third Branch component is the Statistical Processing Section which processes fiscal data.

Research Fellowships Review Branch

The Research Fellowships Review Branch provides initial review of research fellowship applications through Review Panels organized along disciplinary lines.

Review Mechanism

During 1959, the number of Review Panels was increased from seven to nine: anatomy and physiology; behavioral sciences; biochemistry and nutrition; chemical research; general and physical biology; microbiology; pharmacology and endocrinology; biophysical and organic chemistry; and psychological sciences. (The latter two are the new panels.)

Recommendations by the Panels are transmitted to the relevant Institute Specialty Fellowship Board where the application is then considered in relation to the Institute's entire extramural program.

New Section Established

The Branch established an Analysis and Evaluation Section responsible for surveying the effectiveness of the fellowship programs, and for the retrieval of all pertinent program data on a continuing basis.

Foreign Grants and Awards

Planning and administering the International Fellowships Program continued as a Division responsibility under the Foreign Grants and Awards Section. Established in its present form during 1958, the program provides postdoctoral research training in the U. S. to a select list of promising foreign scientists.

Program Expansion

At the beginning of 1959, twenty-two nations of Europe, and Central and South America were listed as participants. At the year's end, the total had risen to thirty-three, and the program had been extended to the Australasian area. Nominating committees were established in Australia, Ceylon, India, Japan, New Zealand, Pakistan, the Philippine Islands and Thailand, and in three other countries: Iran, Israel, and the Union of South Africa.

During 1959, a total of 49 International Fellowships were awarded, as opposed to 17 granted during the previous year.

Total Participants

At the end of 1959, program participants included Argentina, Australia, Austria, Belgium, Bolivia, Brazil, Ceylon, Chile, Colombia, Denmark, El Salvador, England, Finland, France, Germany, Holland, India, Iran, Israel, Italy, Japan, Mexico, New Zealand, Norway, Pakistan, Peru, the Philippine Islands, Union of South Africa, Spain, Sweden, Switzerland, Thailand, and Uruguay.

Visiting Scientist Program

A Visiting Scientist Program, also the responsibility of DRG's Foreign Grants and Awards administrators, sponsored 133 scientists from United States research centers and from research institutions in 28 foreign countries during 1959. The program provides training for selected United States scientists in leading institutions abroad, and provides outstanding foreign scientists the opportunity to work for certain specified periods of time within the laboratories and clinical areas of NIH.

The program was established during 1950. To date, more than 400 scientists have participated.

Internal Operations Branch

The Internal Operations Branch, established during July 1958, provides a variety of administrative and housekeeping functions for DRG, and furnishes central services for the extramural programs of the Institutes and DGMS, as well as for DRG.

The breakdown of these services and their utilization at NIH is as follows:

Within DRG:	Personnel recruiting, time and leave; property control, space planning, purchase and supply

For DGMS and all the Institutes:	Grants finances; grant expenditure reports
For DRG, DGMS, and all the Institutes:	Travel, mail and files; budgeting and budget forecasting; typing and other services
For all of NIH:	Duplicating Services

Typing Unit

The activities of a routine Typing Unit were expanded to offer a variety of special services to all Division offices, especially in providing assistance to personnel involved in the preparations for scheduled Study Section meetings.

A Flexowriter typewriter, installed in the unit, has lessened the typing workload of many offices.

A complete addressograph operation is in the process of development and will offer additional services in this area.

Duplicating Shop

A subsidiary duplicating shop was established in the Robin Building as a centralized service for all NIH personnel at that location. In the half year it has been in operation, much favorable comment has been made on the quality of the service given. The unit has been functioning under the handicap of very limited facilities.

Grants Finance Section

The Grants Finance Section continues to give full cooperation and assistance in the revised (July 1959) method for payment of grants. (The revised procedure is reported under the section titled "Grants Management Branch.")

Automation Study

A long-range study aimed at integrated data processing (automation) in the extramural program areas was initiated. Two employees of the Office of Administrative Management, NIH, were detailed to the Division to make this study and to give advice as to areas where automation techniques can be installed most effectively.

Mail and File Unit

The Mail and File Unit converted to a terminal digit, open-shelf filing system, as did the file units of the Research Fellowships Review Branch (Robin Building), and the Health Research Facilities Branch (also in Robin Building). In each case the new system is proving superior to the formerly used straight numerical systems, involving upright four-drawer steel file cabinets. The new system is faster and utilizes less critical floor space.

Future Objectives

The Branch plans to discontinue the snap-out offset reproduction plate that is now a part of extramural program application forms. A Xerographic offset reproduction plate-making machine will be installed. The machine will transfer applications that are typed on plain paper to offset reproduction plates at a speed of approximately 240 pages per hour. The quality of reproduction from these plates will be far superior, and the offset press machine time involved in the reproduction process will be cut considerably. A savings of many thousands of dollars annually is anticipated. The plate-making machine that will make this possible will not be available until sometime during 1960. It will rent for $95.00 per month.

A combination Application for Research Grant Support and Statement of Grant Award form is being developed. It will be used for "previously recommended" (committed) research grants. When filling out his request for a grant, the applicant will be simultaneously filling out two-thirds or more of the "Award Notice" that will later be countersigned and mailed back to him as official notice of approval.

In the more distant future, it is anticipated that "award notices" and many other forms used in the review and approval process will be prepared automatically from punch cards fed to a high-speed printer, directly to offset reproduction plates.

Problems

A year ago, the most critical problems with which the Division was confronted were the following, in order of seriousness:

(1) Lack of sufficient office space;
(2) Recruitment - inability to fill vacancies - and the loss of key personnel to Institute extramural programs offering better grades; and
(3) Unrealistic "deadlines" for numerous reports.

Today, the same three head the list, but the sequence is now recruitment, space, and deadlines for reports.

The shortage of personnel has resulted in a great deal of overtime. Paid overtime averaged $5,454 monthly from July through December 1959, inclusive. This approximates 1,683 paid overtime manhours per month, and does not take into account the many additional overtime manhours of work performed by personnel in the higher grade positions. These hours are given gratis, or on a compensatory time off basis (where possible).

The office space shortage is as critical as it was a year ago, and continues as a most serious problem.

Division personnel continue to devote a great deal of time and effort to meeting the requirements and demands for information by special investigating committees, DHEW components, and Bureau of the Budget. Since the Division can generally furnish such information on an across-the-board basis, DRG activities in this area permit the Institutes' extramural personnel to devote their time and effort to their programs. In many instances, the deadlines for special reports are so short that there is insufficient time to conduct a thorough and meaningful analysis of the data that are requested. This situation should improve, however, with the expansion of DRG's "integrated data processing techniques" and automation.

The Study Sections

In addition to their responsibility for conducting the technical review and appraisal of research applications and making recommendations to the Advisory Councils, the Division's 35 study sections also develop and encourage research in neglected areas of the health, medical, or related sciences.

During the past year, the study sections planned and programmed a variety of scientific conferences; sponsored the publication of proceedings of selected symposia; conducted evaluations of their individual programs and programmed in new areas; and engaged in a wide variety of other related activities.

A number of the study sections were reorganized and redirected in order to strengthen various areas of research grant review. Some of the significant activities within the study sections during 1959 follow.

Behavioral Sciences and Mental Health Study Sections

During calendar year 1959 the number of applications reviewed by the Behavioral Sciences and Mental Health Study Sections increased to a peak load of 212 reached in May. Plans were then initiated for the subdivision of these two sections into three. It was decided to make the division along substantive lines rather than to attempt the maintenance of parallel groups.

In October 1959 the subdivision was accomplished. Concomitant changes in both the memberships and purviews of the Mental Health and Behavioral Sciences Study Sections were made. The new study section was given the name Behavioral Sciences, and membership for it was drawn partly from Mental Health Study Section and the former Behavioral Sciences Study Section; a few new members were added. Dr. Murray Aborn was named Executive Secretary of Behavioral Sciences, which reviews applications in the areas of social psychology, sociology, social psychiatry, cultural anthropology and related subjects. Its membership is interdisciplinary.

The remaining members of the two existing sections were reassorted so that the Mental Health Study Section (its full complement filled out by the addition of a few new members) while still interdisciplinary in character, would be focused substantively on applications concerned with clinical problems in psychology and psychiatry, and the study of personality and developmental processes. Dr. Clark J. Bailey was appointed Executive Secretary for this group.

The former Behavioral Sciences Study Section was renamed the Experimental Psychology Study Section, with Dr. Betty R. Horenstein as Executive Secretary. It is also interdisciplinary in character, and reviews applications primarily in the fields of general experimental psychology and psychiatry, comparative psychology and psychophysiology.

The first meetings of the three Study Sections will be in January 1960.

Behavioral Sciences Study Section

The study section sponsored a conference which was held at Skytop, Pennsylvania, May 20-22, 1959. Support for the meeting came from a National Institute of Mental Health grant. This was a small working conference devoted to problems of performance or objective tests of personality i.e., chiefly perceptual and cognitive tasks, as distinguished from questionnaires and projective tests of personality.

It was hoped that the conference would fulfill several purposes: (1) bring about a closer integration of investigators who are employing various kinds of laboratory-type performance tests for the study of personality in order to provide constructive criticisms of such approaches to personality measurement in the form of carefully prepared reviews conducted by three leading authorities or "senior critics"; (2) to stimulate interest in the field; and (3) to stimulate the submission of better research proposals in this field.

Experimental Psychology Study Section

The Experimental Psychology Study Section was formed in October 1959, as a part of the subdivision of the original Mental Health and Behavioral Sciences Study Sections. (For details of this shift see the report of the Behavioral Sciences and Mental Health Study Sections.)

Psychopharmacology Study Section

In July 1959, the Psychopharmacology Review Committee of the National Institute of Mental Health was transferred to the Division of Research Grants and became the Psychopharmacology Study Section. One meeting was then held by the new study section in 1959.

Nutrition Study Section

The Nutrition Study Section held its first meeting in April 1959. Two new members were added at its September meeting and, with the anticipated addition of one more at the January meeting, the study section will have reached its full complement of members.

The section has been interested in a number of areas and became actively engaged in the sponsoring of four symposia. On April 14, 1959, a symposium was sponsored at the annual meeting of the Federation of American Societies for Experimental Biology in Atlantic City in conjunction with the American Institute of Nutrition. The subject of this symposium was "Effects of High Calcium Intakes." The report of this meeting, attended by more than 700 scientists, was published in a special supplement to the December 1959 issue of the Federation Proceedings.

On December 4 and 5, 1959, a workshop conference on X-ray bone densitometry was held at the National Institutes of Health. Attendance at this workshop was by invitation and was attended by members of the Metabolism, Surgery, Dental, and Radiation study sections. The purpose of this workshop was to develop guidelines for the evaluation of applications in bone densitometry.

Planning was initiated on two other conferences, one to be held in September 1960 in cooperation with the Food and Nutrition Board of the National Research Council. The subject is "Protein Needs of Infants and Preschool Children." The second symposium is to be held at the April 1960 meeting of the American Institute of Nutrition on "Mineral Element Interaction."

The Nutrition Study Section reviewed applications from Ecuador, Israel, the Belgian Congo, and many other diverse places. Although the section has on limited occasions expressed concern about its ability to review effectively all applications from remote areas of the world, it recognizes that there are important nutrition interests outside the United States. For example, it is in the present rapidly-developing areas of the world that one sees the more significant nutritional deficiency diseases--kwashiorkor, pellagra, beri-beri, and the like. The study section recognizes that many of these underdeveloped areas offer unique opportunities for nutrition research and it is, therefore, pleased, in spite of present limitations, to be able to review applications from these areas.

A new area of interest to the study section is the development of methodology for nitrition surveys. The study section is at present investigating the current state of nutrition survey techniques and the need for new methods. This program will probably be of interest to several of the Institutes.

Hematology Study Section

In addition to reviewing applications for research grants in the field of hematology, the Hematology Study Section sponsored (under a grant from the National Heart Institute) a conference on "Fundamental Problems and Techniques for the Study of the Kinetics of Cellular Proliferation." This conference was held January 19-21, 1959, at Salt Lake City, Utah. It was attended by 118 investigators and brought together representatives of diverse disciplines to study these problems. The proceedings of the conference were published by Grune and Stratton in July, 1959.

In the coming year the Study Section will co-sponsor, in conjunction with the International Committee on Nomenclature of Clotting Factors, a conference on "Thrombolytic Agents" to be held in Princeton, N. J. in September 1960. This meeting will include representatives from several foreign countries. In addition, there is under consideration sponsorship of a conference on the clinical aspects of fibrinolysis in early 1960.

Hospital Facilities Research Study Section

The Hospital Facilities Research Study Section established, in January 1959, a special subcommittee on program planning to assist the study section in a number of policy and procedural matters vital to its field of interest and responsibility.

The first draft of the special subcommittee's report was discussed by the subcommittee and the study section chairman with the Federal Hospital Council at the council's meeting on March 12.

Based on the objectives of the study section (as outlined in the Hill-Burton Act) the conference outlined a classification of areas which are within the section's purview, including public needs; the effect of economic factors on services, facilities, etc.; all aspects of the hospital's physical facilities; recruitment and education of investigators, teachers, and administrators; and development of criteria for patient care and rehabilitation.

Based on the foregoing specifications, the study section determined to accept responsibility for reviewing or preparing recommendations intended to strengthen research and teaching resources, in that activities recommended for support should have educational-training as well as research or demonstration functions. These purposes may be served, in part, by university programs in hospital administration; schools of public health; departments of preventive medicine; schools of public administration, business, architecture, or engineering; or university social science centers. Review of applications should include a thorough determination of the institution's quality of personnel, their known professional capacities and achievements, and the reality of the proposed mechanisms and arrangements.

At the March 12 conference, the study section also outlined nine criteria for the appraisal of research development proposals and made two recommendations: (1) the support of training programs in the research area, namely projects aimed at research development, and (2) the establishment of a special committee for planning a national conference on research in the study section's field of interest.

Later in the year (June 29-30), the study section held a special meeting for the purpose of exploring further the section's policy and procedural problems.

Sanitary Engineering and Occupational Health

A sharp increase in grants awarded for research in occupational health, food science and technology, and water pollution was recorded in 1959. Twenty-five occupational health grants awarded in 1959 totaled $508,536, as opposed to 11 grants totaling $216,000 during 1958. Water pollution grants increased from 84 to 126 and from a total of $821,500 to $1,307,000. Forty-nine grants totaling $630,500 were awarded during 1959 in the fields of food science and food technology, as compared to 13 such grants totaling $200,000 during 1958.

The study section approved and planned two conferences for 1960. The first, "Conference on Waste Water Reutilization," was scheduled for January 4, 1960 at the California Institute of Technology, Pasadena, California. This meeting will familiarize study section members with the need and methods for reclaiming waste water, and with the public health aspects of reutilization of water.

The second conference, "Physiological Aspects of Water Quality," is planned for the summer of 1960. Specific topics to be explored include analysis and instrumentation for determination of chemical substances, evidence of effect and action of chemicals, and recommendations for treatment of water supplies.

The study section recommended the 1960 publication of two booklets. "One Hundred Problems in Environmental Health" is intended as an aid in recruiting scientists from various disciplines to study problems in environmental health. The booklet will suggest needed research areas to those individuals needing guidance. The other publication, "Forward Oriented Reviews," will state factual findings of scientists prominent in the environmental health field and will present a variety of integrated research projections.

Biochemistry Study Section

The present Biochemistry Study Section was formed in late 1958 as a result of a decision to divide the review of certain grant applications between the Biochemistry and Physiological Chemistry Study Sections. The rapidly increasing volume of applications for support of research in biochemistry resulted in a concomitant increase in consultants' time required for review, project site visits, and regular meetings. This burden became too great to place on the members of a single study section. Membership of the new section was drawn (in part) from consultants who had been appointed to the parent Biochemistry Study Section, and was augmented by new appointments. The Biochemistry Study Section is particularly well constituted to evaluate physically-oriented biochemical research grant applications pertaining to enzymology, protein and carbohydrate metabolism, and nucleic acid chemistry.

During 1959 the Biochemistry Study Section continued to be concerned with the recruitment of graduate students. In conjunction with the Physiological Chemistry Study Section, two proposals were developed which, hopefully, would have stimulated undergraduates to seek and enter research careers in the life sciences. The plans were pointed toward departments of chemistry and biology in the smaller liberal arts colleges which now provide little or no teaching of the fundamentals of biochemistry and related life sciences. As formulated, the plans could not be implemented, but the study section continues to be interested in mechanisms whereby more undergraduates could be interested in research careers in biochemistry.

The study section has continued to suggest that applications for support of synthetic medicinal and natural products chemistry related to the health sciences could be evaluated best by an advisory group set up to work in this area exclusively. A decision was made to consolidate under one reviewing panel - advisory to the Division of Research Grants - all such applications previously assigned to the Biochemistry, Cancer Chemotherapy, Endocrinology, and Pharmacology and Experimental Therapeutics study sections. This panel will be composed of some present study section members and newly appointed advisors selected for their knowledge of medicinal chemistry and pharmacology.

Surgery Study Section

During 1959 the Surgery Study Section reviewed a total of 279 applications of which 194 were approved, 73 disapproved, and 12 deferred.

A pamphlet titled "The Care of the Dog in Medical Research," which was originally sponsored by the Surgery Study Section was revised and submitted for clearance for publication as the third edition.

In view of (1) the large amount of research being supported by grants from NIH and other sources on the problem of prosthetic mitral and aortic valves, and (2) in view of the likelihood that unless this work is coordinated there may be needless duplication of effort in resolving problems - particularly with respect to the design and construction of these valves - the study section is formulating plans for a conference on prosthetic heart valves to be held during September 1960. This proposal will be presented to the National Advisory Heart Council for action at its March 1960 meeting.

A major concern of the Nursing Research Study Section is strengthening research in nursing practice. Continued consideration was given to the place of advanced clinical training in the education of nurse researchers, and the view of the study section is that support should be provided in some way for such clinical training.

The section sponsored two inter-study section discussions of research on curriculum in the health professions on July 10-11, 1959, and November 15, 1959. It was agreed that curriculum development projects can be differentiated from curriculum research proposals by using the same criteria which are used to evaluate other research grant applications. Recommendations were made to the appropriate Divisions of the Public Health Service regarding the kind of curriculum research that is needed, and actions which might be taken to improve the quality of the applications which are submitted.

Recommendations for approval of research grant applications made by the study section in the first two and one-half years of its existence were reviewed, and the section is considering how to conduct a periodic review which would enhance its ability to evaluate proposals and point up research training needs and other problems of program development.

Pathology Study Section

During 1959, Pathology Study Section reviewed 350 applications most of which were concerned with experimental pathological studies in cancer and in cardiovascular and metabolic diseases. Of particular interest to the section was the steady increase in the number of applications from independent, non-university affiliated hospitals. While this group of institutions contributed only about four percent of the proposals reviewed during 1958, they accounted for approximately 12 percent of the applications reviewed this past year.

In order to increase the study section's general familiarity with new methods currently being introduced into research in pathology, a series of workshops was initiated in early 1959. The first of these was devoted to electron microscopy and was organized by Dr. H. Stanley Bennett at the University of Washington, in connection with the study section's May meeting. The guest speaker was Dr. Sanford Palay of the Section on Neurocytology, National Institute of Neurological Diseases and Blindness. The proceedings of this meeting are being prepared for publication. The second workshop, in immunopathology, was arranged by Dr. Frank Dixon at the University of Pittsburgh immediately before the September review session.

On both of these occasions, the Pathology Training Committee, Division of General Medical Sciences, and the Intersociety

Committee on Research Potential in Pathology were guests of the Study Section.

The Study Section also cooperated with the American Rheumatism Association, the Arthritis and Rheumatism Foundation and the National Institute of Arthritis and Metabolic Diseases in planning a February, 1959 "Conference on Comparative Pathology of Arthritis and Rheumatism," organized by a study section member, Dr. Leon Sokoloff of NIAMD. The proceedings of this conference were submitted for publication.

This past year saw the completion or advancement of several projects initiated in earlier years. The "Manual of Experiments in Pathology" edited by a member of the study section, Dr. Hans G. Schlumberger, was printed as a 133-page supplement to Laboratory Investigation. The proceedings of the Conference on Chemical Organization of Cells, Normal and Abnormal, were published in March-April, 1959, in the same journal.

Plans were initiated during the year for additional workshops in "Radiation Methods in Pathology," in "Quantitative Methods in Histology and Cytology," and for a survey of the present status of pathology.

Metabolism Study Section

Formed early in 1959, the Metabolism Study Section assumed responsibility for the review of applications dealing with metabolic processes in human subjects and experimental animals, and the changes which occur in these processes in pathological states. Especially notable among the latter are many in which metabolic derangements constitute the primary abnormality.

In a resolution directed to the Chief, Division of Research Grants, and subsequently distributed to the NIH Grants Branches, Metabolism Study Section members expressed their awareness of, and desire to cooperate in, the solution of problems in the development of gas chromatography, especially as applied to serum and tissue lipids. In this same direction, copies of a Nutrition Reviews supplement dealing with gas chromatography were made available by Dr. E. H. Ahrens, Jr., incoming Chairman, Metabolism Study Section, and were distributed to other interested study sections by the office of the Executive Secretary.

Study section plans for 1960 include sponsorship of an Insulin Bioassay Seminar to be held in January in Los Angeles, coincident with the meeting of the American Diabetes Association. Participants in the seminar will compare methods for the quantitative assay of insulin in body tissues and fluids, with special emphasis on a new biological technique using the rat epididymal fat pad.

Cell Biology Study Section

During 1959, the Cell Biology Study Section reviewed a total of 245 applications: 128 of these were considered at the section's January meeting, and 117 were reviewed during the April sessions. (The Study Section held its first meeting during September 1958, reviewing 117 applications.)

The Section continued with plans for the establishment in selected institutions of "University Laboratories for Cell Biology" designed to contribute to the security and research effectiveness of talented cell biologists and to provide training facilities in this research area for young scientists. However, although no great objections were raised to this plan by the National Advisory Councils, no enthusiasm was expressed for initiating the proposed program.

In addition to its continuing endeavors in advancing the research effort in the United States on fundamental investigations of the cell and its parts, the Cell Biology Study Section is engaged presently in organizing a Society for Cell Biology as an inclusive meeting ground for investigators interested in cell structure and function.

The cell and its organized protoplasm is the seat of life and its manipulations. A better understanding of life and its manifestations are, therefore, dependent on a more complete understanding of the cell. To date, comprehensive study of the cell is being neglected and amazingly little is known of the true structure and functioning of cells. Members of the Cell Biology Study Section are convinced that now is the time to reexamine the cell, especially in light of the tremendous advancement of technical procedures occurring since World War II.

The study section has undertaken the task of stimulating research on the cell by its efforts to organize a Cell Biology Society in the United States. There is no substitute for direct interchange of views, particularly at the time when new ideas start taking their first shape. At such critical times there is nothing more stimulating than conversation with another scientist who--although knowing something about the system under discussion--has a completely different viewpoint. It is anticipated that the organization of a Cell Biology Society will serve to promote more effectively a continuing association of investigators trained and experienced in various disciplines and interested in the field of cell biology.

Endocrinology Study Section

The Endocrinology Study Section continued to pursue with vigor research in the chemistry, fractionation and assay of the several pituitary hormones. The bulk of the work has been done with pituitary glands from beef, sheep and pigs. A new effort covers work in the same area but from materials of primate origin, including human. This work is being supported by research grants to Dr. Alfred Wilhelmi, chairman of the study section, at Emory University, Georgia.

During the year, the study section received 188 requests, for gifts of pure pituitary hormone preparations. In addition, it also processed 40 requests for aldosterone (made by Ciba Pharmaceutical, Inc.), and 91 requests for radioactive steroid preparations. The radioactive steroids were prepared through a research grant to Dr. Gregory Pincus.

Two members of the current study section panel were appointed as an advisory committee to the Yerkes Laboratories of Primate Biology. Through a grant from the National Cancer Institute, the section held a conference in Gatlinburg, Tennessee, December 3-6, 1959 on the "Chemistry and Assay of Pituitary and Urinary Gonadotrophins." The minutes of that meeting will be published in a separate volume by Charles C. Thomas, Springfield, Illinois.

Tropical Medicine and Parasitology Study Section

Parasitology and Tropical Medicine Study Section was reconstituted and re-named the Tropical Medicine and Parasitology Study Section in order to broaden the scope of the group, to review applications of interest to all the National Institutes, to highlight medicine in the tropics, and to encourage research in areas of geographical medicine not being adequately treated. Accordingly, the section's membership was enlarged from 12 to 16. Membership includes specialists with medical, veterinary, or other related degrees, who have a wide range of interests and competence, and who are strategically located geographically.

New members were provided orientation prior to the meeting in September and were invited to audit the meeting.

An evaluation of all of the research applications reviewed by Tropical Medicine and Parasitology Study Section and predecessors was accomplished. Of the 686 applications reviewed through Fiscal Year 1958, 429 were funded. While a major "breakthrough" was not noted, most projects supported were productive and made significant contributions to science.

The first conference to be held on bat rabies was co-sponsored by Tropical Medicine and Parasitology Study Section and Virology and Rickettsiology Study Section on July 10-11, 1959. Some 90 specialists participated representing the many disciplines involved in the study and control of bats and rabies in bats. Planning was begun on a second conference on bat rabies to be held during July 1961.

Tropical Medicine and Parasitology Study Section will participate in the fourth conference on research needs in tropical medicine to be held in April 1960, at Louisiana State University in New Orleans. A steering committee met at NIH on November 5, 1959 to plan the agenda and to select the speakers and participants.

Study section meetings were held at NIH during January and September and an April meeting was held in Vero Beach, Florida, following a tour of project site visits in Florida during April 12-25, 1959. The members of the study section were impressed with the excellence of most of the work being supported. The rapport established among study section members and grantees was significant.

During 1959 there were 142 applications reviewed, of these, 97 were recommended for approval. Of 11 applications received from 6 foreign countries and territories, 10 were recommended for approval.

Members who completed their appointments to the Tropical Medicine and Parasitology Study Section were: Dr. Leslie A. Stauber, Chairman, Dr. Harold W. Manter, Dr. Theodor von Brand, and Dr. Jose Oliver-Gonzalez. Dr. Stanley B. Freeborn was appointed to succeed Dr. Leslie A. Stauber as Study Section chairman.

Human Embryology & Development Study Section

As of the end of 1959 there were 289 active grants which had previously been reviewed by the Human Embryology and Development Study Section. During the calendar year, 198 applications were reviewed, and 113 were recommended for approval in the total amount of $1,481,646.

The *ad hoc* Cerebral Palsy Review Committee, formerly of NINDB, was merged with the Human Embryology and Development Study Section after the September-October round of study section and committee meetings. The study section was given the responsibility for reviewing applications originating from the collaborative institutions in the cerebral palsy program as well as other applications dealing with the etiology of cerebral palsy. Four members of the *ad hoc* Cerebral Palsy Review Committee were asked to join the study section.

At the September 1959 meeting of the Human Embryology and Development Study Section it was decided to hold a special session for the purpose of reviewing the sections activities since its formation five years ago. This meeting will be held on January 13, 1960, immediately following the next meeting of the study section. All former members of the section, as well as the present members of the Embryology and Development Training Committee, Division of General Medical Sciences, will be invited. In addition to the program review, the special meeting will attempt to outline areas which need stimulation.

Physiology Study Section

At the Physiology Study Section meetings during 1959, most of the time was spent in reviewing a steadily increasing number of research grant applications. The study section has been particularly concerned with the maintenance of high standards for approval and has made every effort to maintain such standards even though, at some meetings, it may mean an increased level of disapproved applications. It is felt that even though funds for support have been increasingly available, it is not in the best interests of bio-medical research to lower standards in any way.

Dental Study Section

During calendar year 1959 the Dental Study Section reviewed 227 applications, of which 117 were recommended for approval, 95 for disapproval, and 15 for deferral.

Through a research grant from the National Institute of Dental Research, the Study Section sponsored a conference of international flavor on maxillo-facial anomalies on December 6-9, 1959. Approximately 125 people were in attendance. The proceedings will be published during 1960 in a separate volume by Charles C. Thomas of Springfield, Illinois. Each dental school in the United States was invited to send an observer and numerous dental schools had participants in the program. It is believed that this conference made obvious some new areas of research which bear directly on the national health. Future similar efforts are anticipated.

During November 1959, Dr. Mark H. Conner was appointed Executive Secretary to the Dental Study Section.

Physiological Chemistry Study Section

Circumstances leading to the cleavage of the Biochemistry Study Section and formation of the present Physiological Chemistry and Biochemistry Study Sections are described in the section of this report dealing with the latter study section.

Since development of these analogous but distinctly separate study sections, the Physiological Chemistry Study Section continued to be concerned with studies of the many facets of recruitment of graduate students into fields of research in the life sciences. General discussions, continued in collaboration with the Biochemistry Study Section, pointed to the need of development of stimuli at pre-university level which would objecttively result in motivation of greater numbers of candidates for graduate degrees in biochemistry and related disciplines, and better preparation in the physical sciences at the undergraduate level of those already motivated to seek postgraduate training in anticipation of careers in research and teaching. With full knowledge of existing and contemplated programs of the National Science Foundation, the American Institute of Biological Sciences, and other organizations to replenish and increase the scientific manpower pools for fundamental research in the future, the Physiological Chemistry Study Section is of the opinion that an opportunity exists for the National Institutues of Health to participate in an inadequately supported area. As a result of joint discussions with members of the Biochemistry Study Section, two proposals were developed for consideration by the study sections and the Division of Research Grants. One of

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Toxicology Study Section

The Toxicology Study Section was activated during February 1959. Its primary interest is to encourage research into the mechanism of action of non-chemotherapeutic compounds which in relatively small amounts produce untoward or undesirable pharmacological effects.

During the year, this group focussed its attention on pesticide residues, food additives and insect resistance. The section began developing a program to encourage more investigators to examine these areas of public health interest. The present aim is to interest investigators in developing new approaches to (1) the methodology of determining toxic effects and (2) to the determination of small amounts of chemicals which may find their way into a normal diet.

With the approval of the National Advisory Health Council, the study section determined to make its interest known to the various scientists and professional groups who now have, or could develop, competence in these areas of research.

Accordingly, a September 1959 meeting was held on the campus of Oregon State College at Corvallis. At that time, the study section joined with the Department of Food and Dairy Technology in sponsoring a two-day symposium on food enzymes. Daily attendance was approximately 225.

The section also joined with the Food Protection Committee, National Research Council, and with the Toxicology Committee, NRC, to cosponsor a one day symposium on toxicology. This conference will be introduced to the program of the Federation of American Societies for Experimental Biology by both the American Society of Pharmacology and Experimental Therapeutics and the American Institute of Nutrition. Reprints of this symposium will be available to the study section for distribution.

At its two meetings, twenty-six applications were reviewed and seventeen (65%) were recommended for approval.

The Radiation Study Section

The Radiation Study Section reviewed 162 applications. Although a major part of calendar year 1959 was devoted to review and evaluation of research grant applications, an appreciable amount of time was devoted to programming activities.

As an outgrowth of discussion by an ad hoc committee of the Radiation Study Section a two-day conference will be held at Carmel, California in the spring of 1960 on "Developments in Cellular Radiobiology," and on "Experimental and Clinical Trials with Combined Chemotherapy and Radiotherapy." This is an actively evolving field in which the conference technique can promote much needed exchange of information and planning. The preliminary experiences of several radiotherapeutic groups in the country will be brought together with a view to planning for uniform reporting and evaluation.

Also developed within the context of the study section's programming interests, a project is now underway aimed at developing a standardized system for coding and recording data on radiation-treated neoplasms and on the results of therapy. It is hoped that the formulation of a code designed specifically to meet the needs of radiotherapists may prove to be a first step toward ultimate establishment of cooperative studies in the results of radiotherapy.

Other activities involved the participation of two study section members in the Radiobiology Mission to Russia; continued efforts to foster long-term study of latent effects of radioiodine therapy; and, reactivation of a subcommittee concerned with gamma-ray spectrometers and the putting of spectrometer calibration into a matrix form with coefficients dependent on crystal size and spectrometer characteristics.

Virology and Rickettsiology Study Section

By the beginning of 1959 the Virology and Rickettsiology Study Section, at the request of the National Cancer Institute, had begun to undertake a major effort to stimulate research in virology in relation to human cancer.

The study section appointed a Committee on the Tumor-Viruses which made project site visits to many laboratories and reported back to the study section. In order to serve the program, the Section held an additional review meeting on February 21, 1959. Largely as a result of these efforts, the National Advisory Cancer Council was able to meet the Fiscal Year 1958 Congressional mandate for vigorous stimulation of research in the field of viruses and human cancer.

Jointly with the Tropical Medicine and Parasitology Study Section, the Virology and Rickettsiology Study Section sponsored a Panel Workshop on Bat Rabies, held July 10-11, 1959 at NIH. For the first time, scientists representing all of the disciplines concerned with the problem were privileged to meet on the same common ground in a very effective discussion.

The study section initiated plans for a national "Symposium on the Phenomena of the Tumor-Viruses," under the general chairmanship of Dr. Joseph W. Beard of Duke University. This is to be held during March 1960 in New York City.

The Executive Secretary, upon request of the Office of the Director, NIH, completed an extensive "Subjective Analysis of Influenza Research Projects," covering as far as possible all projects supported by NIH and other agencies. This information was made available to the Public Health Service Advisory Committee on Influenza Research.

Through a special *ad hoc* subcommittee, the study section recommended that a National Committee on the Adenoviruses be set up to deal with the characterization, classification, and typing reagents necessary for coordination of the research effort in this field of virology.

Biophysics and Biophysical Chemistry Study Section

In addition to its regular review of research grant applications, the Biophysics and Biophysical Chemistry Study Section spent a considerable amount of time in programming activities. In the summer of 1958 the section sponsored the four-week conference, "Biophysical Science--a Study Program," at Boulder, Colorado. The sixty comprehensive lectures presented the latest information on the many vital areas included in the broad field of biophysical science. This material is available in book form, published by Wiley Press. In addition, the same articles were presented in the 1959 January and the April issues of the *Reviews of Modern Physics*.

The section also sponsored, in cooperation with the Josiah Macy Foundation, a conference on "Biophysical and Biomedical Instrumentation" at Princeton, N. J. on October 4-6, 1959. Transcripts of this conference will be available for limited distribution during 1960.

Under special programming funds, the study section made grants to Dr. R. H. Maybury of Redlands University, Redlands, California, for visiting lecturers under its research training program, and to Dr. D. J. Fluke of Duke University for visiting lecturers in connection with seminars on Molecular Biology.

The section recommended that a grant be approved for Stanford University to sponsor a Symposium on "Free Radicals in Biological Systems" in March 1960. (Approval was given.) Papers to be submitted will cover biochemical, spectroscopic, magnetostatic, and magnetic resonance studies of free radicals in biological systems or substances. Approximately 30 lecturers are being invited. The proceedings will be published by Academic Press.

A special grant was recommended by the section (and approved by the Surgeon General) for the preparation and distribution of a brochure for high school students to acquaint them with the challenge of biophysics. This was handled through the Education Committee of the Biophysical Society. The section also planned a two-week Summer Institute for approximately 50 undergraduates at Massachusetts Institute of Technology during August-September, 1960. This course will include lectures and laboratory sessions. Outstanding students from small colleges (3,000 enrollment or less) geographically distributed throughout the United States, are being invited. The lectures and demonstrations will be presented by leading biophysicists, chiefly from the Boston area. In this connection, the important point should be made that Dr. Walter Koltun replaced Dr. Richard Bolt as full-time consultant to the study section. (As of January 1, 1960 Dr. Bolt will be Associate Director of the National Science Foundation.) Dr. Koltun is working closely with the section in organizing a unique, two-week conference at Massachusetts Institute of Technology for the summer of 1960. For the immediate future, Dr. Koltun plans to visit biophysicists who are strongly oriented toward the physical side, and who may need some advice about the problems involved in dealing with biological material. Whenever possible, such visits by Dr. Koltun will be made with the Executive Secretary and with other members of the study section.

As a result of a Congressional request, a report on the outlook for the future development of research potential in biophysical science was prepared under the direction of Dr. R. H. Bolt during his tenure as consultant to the section.

The study section is also sponsoring a program of visiting lecturers of leading biophysicists at colleges throughout the country. The section felt that it would be advisable to initiate the program on a modest basis; therefore, the formal action proposed that a test run of 15 lectures be arranged for the fall 1959 term.

Genetics Study Section

The Genetics Study Section, established during June 1958, held its first meeting in September of that year. Beginning then, and throughout 1959, the study section has been engaged in a number of studies: (1) an examination of the status of genetic research as to subject matter and support--both Federal and non-Federal; (2) identification of some of the more urgent problems which the current expansion of effort in medical genetics has precipitated; and (3) an exploration of realistic approaches to meeting certain of the more urgent needs through study section activities during 1960-61.

As a result of these studies, the section initiated a number of planned collateral activities in an effort to contribute materially toward the sound growth of medical genetics in its broad aspects.

A major accomplishment of the past year has been the development and crystallization of plans for a series of symposia on "Methodology in Medical Genetics." These were carefully designed to consolidate critically needed information on current methodology, and to make this information readily available to the actual and potential genetic research community through prompt publication and wide distribution at minimal cost. The three symposia are: (1) Human Genetics, May 13-14, 1960, University of Utah at Salt Lake City; (2) Mammalian Genetics, September 9-10, 1960, Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine; and (3) Basic Genetics, May 1961, University of Texas at Austin.

For each area the most recent advances in statistical, cytological, biochemical, immunological and other pertinent methods, including detailed information as to special techniques, genetic stocks, equipment sources, terminology, etc. will be presented by appropriate geneticists from the United States and other countries. The unique product of each symposium will be the publication of a volume designed to serve as a complete and timely sourcebook of genetic methodology.

The successful accomplishment of these goals will depend not only upon the careful planning of each program, but to a large extent upon the willingness of key geneticists to carry out major and somewhat tedious assignments in the preparation of manuscripts, which must include detailed information on source materials. Therefore, study section members have informally explored the potential interest in these programs. Because of the critical need for the type of information which will be brought together through these efforts, there is considerable evidence that the prodigious task which the section has undertaken will have the cooperation and support of the genetic research community.

Funds for these symposia and resultant publications will be provided by the Division of General Medical Sciences. The detailed program and participants of the first symposium on Human Genetics has been completed; the second and third phases on Mammalian and Basic Genetic Methodology, respectively, will be finalized at future meetings of the study section.

The section's overall program plans include the following additional areas:

(1) Review of Ongoing Genetic Research--A periodic survey of the status of genetic research is made to obtain and maintain a surveillant perspective of the field in relation to growth of the NIH genetic programs and the national need.

(2) Manpower and Facilities--An assessment of the existing personnel resources in genetics is being carried on by a sub-committee of the Study Section to determine the availability of manpower in the field

(3) Genetic Literature--A sub-committee of the Study Section is considering various problems related to publication of genetic literature in order to facilitate the dissemination of research results in practical and useful forms. Certain of these

problems are being explored with editors of scientific journals, the publisher of Current Contents, and the scientists concerned.

(4) Genetic Stocks--The Genetics Society of America has established a Committee for the Preservation of Genetic Stocks to consider, advise, and to coordinate efforts on a national basis. The Genetics Study Section maintains liaison with this committee to assist in assessing the needs for genetic stocks in areas of special concern to medical genetics and the NIH.

The various activities which the Genetics Study Section has undertaken are clearly supplemental to other means of program development which are appropriately utilized by the study section in carrying out its major function of the review of applications for research grants in genetics.

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